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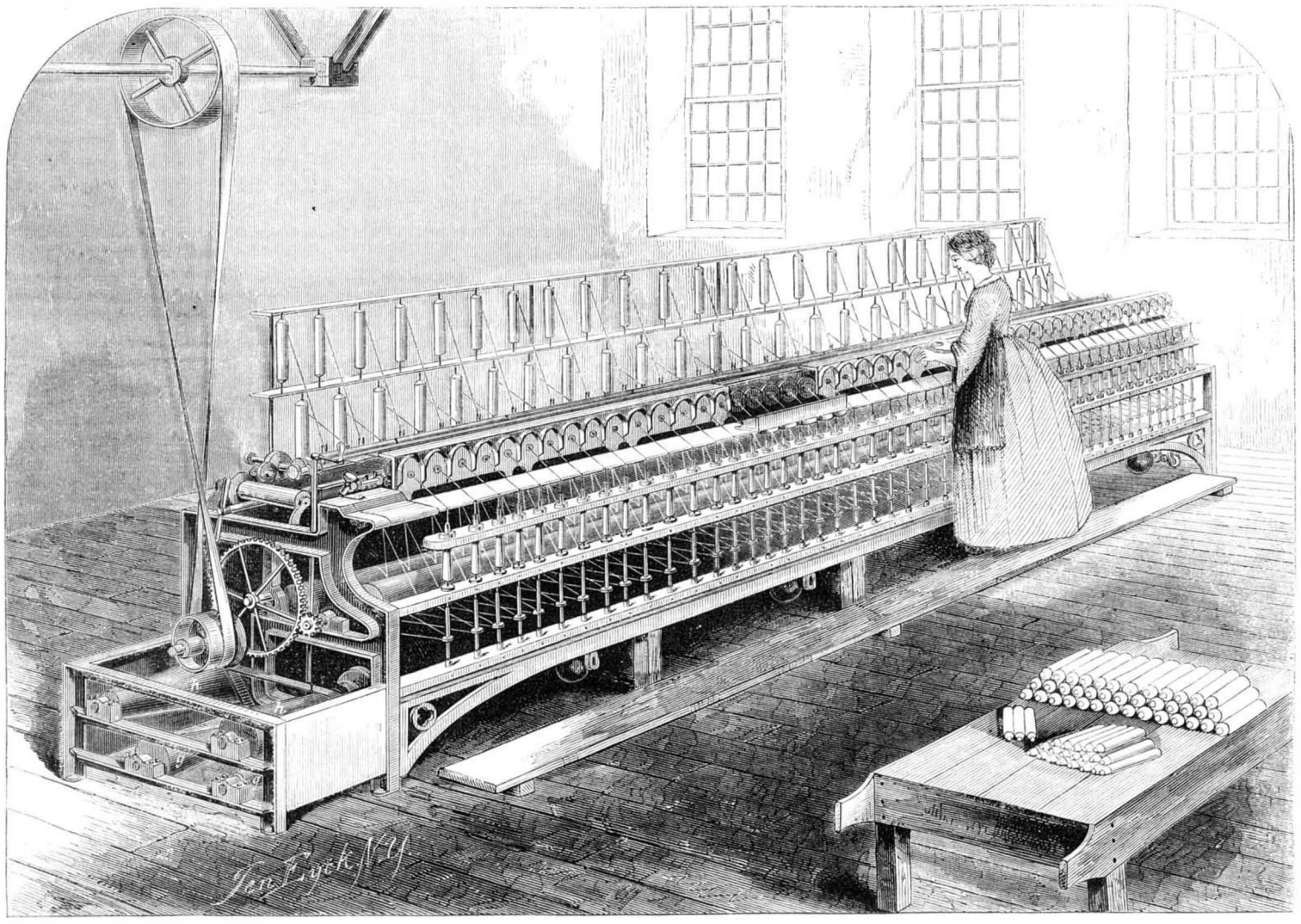
Victory's Wool Spinner.

The ordinary operation of spinning wool by the jack is intermittent, as on the old-fashioned hand spinning wheel. The sheet of wool, as it comes from the last card, or condenser, is split by suitable mechanism into narrow bands, which, without being twisted at all, are, by being gently rolled back and forth between the surfaces, loosely felted into small tender rolls or roving, somewhat similar to the rolls prepared by hand cards for spinning on a hand wheel. These rolls, wound upon long spools, are placed upon the jack, which spins them into yarn. The spindles of the jack are arranged in a carriage, which runs back and forth upon a railway a distance of about seven feet, the yarn being spun as the carriage runs out, and wound upon bobbins on the spindles as it returns. After the carriage has run out a portion of the distance (say two or three feet) a stop comes down upon the roving, grasping it firmly, and confining the remaining portion of the operation to the length already fed forward; then as the spindles continue to recede, the yarn is stretched or drawn as it is twisted. As the twist in a thread always tends to run into the small parts, and as the large untwisted parts yield most easily to the stretching strain, these large parts are drawn down, and a thread or yarn of uniform size is produced by this operation. After the carriage bearing the spindles has receded to the end of its track, and when the yarn is sufficiently twisted, the turning of the spindles ceases, and the carriage is run back to its place, a sufficient motion being given to the spindles during the return to wind up the twisted yarn upon them. A second supply of wool is then fed forward, and the operation is repeated, the spinning being thus intermittent.

The plan of stretching a thread as it is twisted to make it of uniform size, has been practised from remote antiquity, but its adaptation to machinery was the great invention of Hargreaves—the first step in that series of inventions which enable the civilized man of our day to make his clothing mainly by the great forces of nature instead of by the strength of his own muscles. Since the invention of Hargreaves in 1767, numerons attempts have been made to spin the thread by a continuous operation, instead of the intermittent one of the jack and mule; but while these have succeeded perfectly with the cotton fiber, they have practically failed heretofore in their application to wool. We now, however, have the satisfaction of illustrating a machine which is in operation at the Globe Mills in Utica, in this State, where it was visited by our artist, which operates continuously, and which, we are assured, is a perfect practical success; making a better thread with less waste, occupying one-third the room, and requiring less skill in the operator than the jack.

It is essentially an adaptation of the cotton spinning frame with the ring traveler to the spinning of wool. The spinning, though continuous, consists of two operations, the first being a slack temporary drawing twist, effected between the feed and drawing rolls by giving the latter, in addition to their rotation on their axes, a rotation at right angles to this, while the second operation consists in twisting the yarn by the spindles.

Fig. 1 of the engravings is a perspective view of the whole machine, and fig. 2 is a section of the drawing rolls and head. The feed rolls are of the ordinary construction, and the drawing rolls, *e*, besides rotating on their axes, are carried around at right angles by the rotation of the drawing head, A, in which they are secured. The disk, M, is fixed upon the end of a hollow shaft, *n*, upon which is the pulley, *d*, by which the rotary motion is imparted to the head, the thread passing through the hollow shaft, *n*. Upon this shaft, *n*, is a loose gear wheel, *o*, meshing into a similar wheel, *p*, upon the shaft of which is the worm, *i*, that imparts the rotary motion upon their axes to the drawing rolls, *e*. The revolutions of the gear wheel, *o*, are controlled by means of the gear, C, which has the beveled pinion, D, upon the opposite



VICTORY'S WOOL SPINNER.

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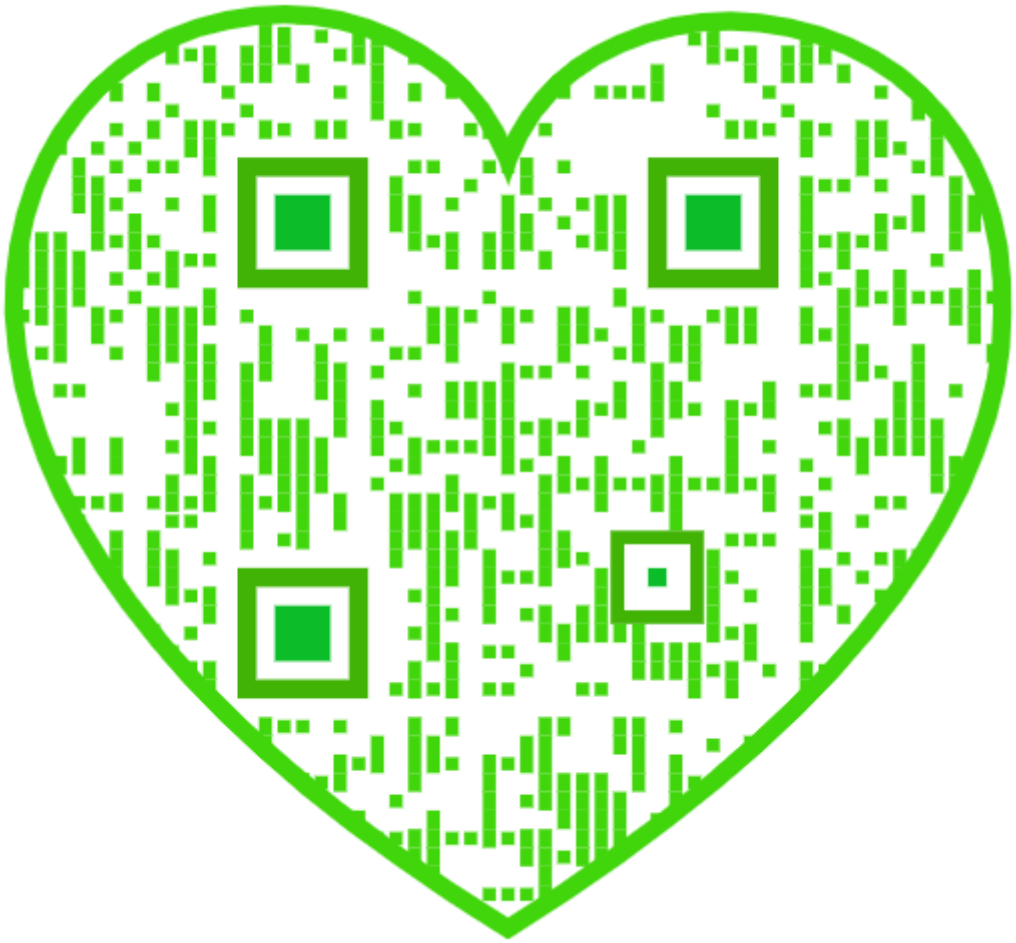
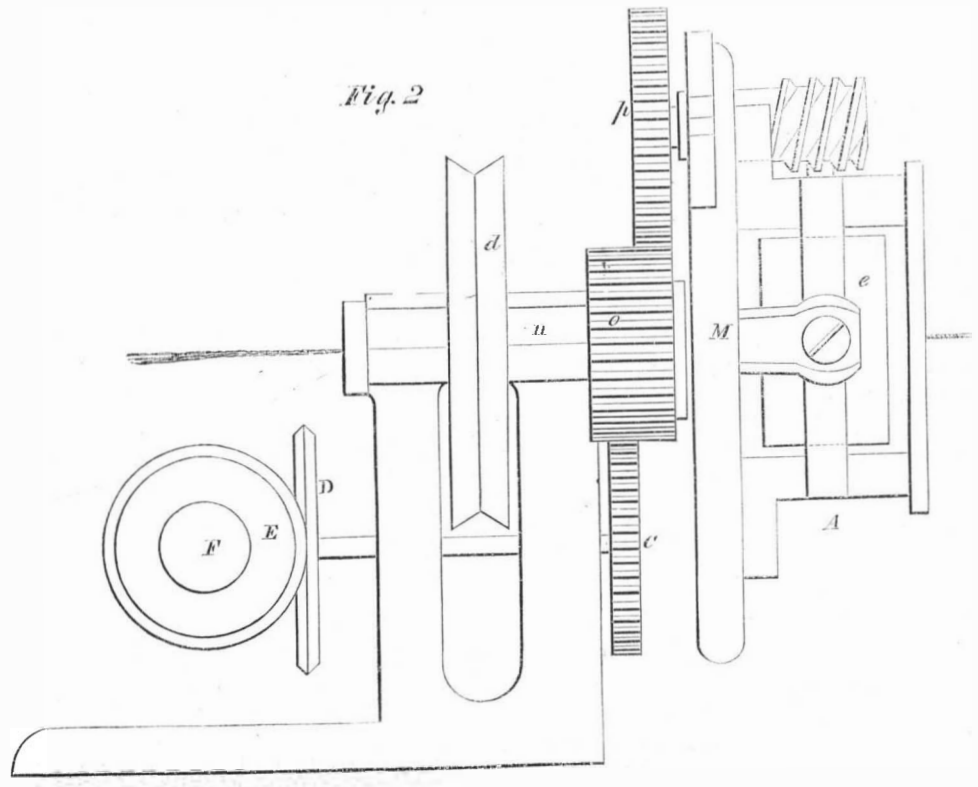


end of its shaft; the pinion D meshing into the pinion E, upon the long shaft, F, which extends the whole length of the frame, and thus controls the motion of the drawing rolls, *e*, in all of the heads.

As wool of short staple requires more twist than that of which the staple is long, a machine, in order to be practically useful, must be adjustable in this respect, and in the machine here described this adjustment is secured in the most complete and simple manner. The long shaft, F, is driven by a pair of cone pulleys, *g g*, fig. 1, so that the speed of the shaft, and consequently the speed of that rotation of the rolls, *e*, which twists the roving, may be varied at will. The speed of the feed rolls is also regulated by a pair of cone pulleys, *h h*, fig. 1, and thus drawing the twist between the feed and draft rolls, can be adjusted with the greatest ease and precision while the machine is in operation; and when once arranged for the kind of wool used and of the thread desired it remains fixed, requiring no further care of the operator. The spinning twist is regulated by changing gears in the usual manner. The machine now running at Utica is tended by the usual help of a cotton spinning frame, and operates in the most perfectly satisfactory manner in every respect.

In this description we have presented the essential features of the invention, omitting several details, but the practical objections have all been considered and obviated. For instance, to prevent the yarn in case of a break from winding around the feed rolls, a metallic shield is placed in front of them, fitting them closely, and having a hole for the passage of the yarn. And to prevent the end of a broken thread from flying in contact with those near it, a fender is placed in front of the rolls. This fender is made to turn down in sections, one of which is shown in fig. 1 thus turned down. The distance between the back and front rolls is also adjustable, to accommodate the machine to wool of different lengths of staple, this adjustment being effected while the machine is in motion. In short, the machine was invented by a practical man, and has satisfied intelligent and disinterested manufacturers that it must come into general use, and effect a revolution in the mode of spinning wool. The frame shown in fig. 1 has spindles on only one side, but the design is to make the frames double, with spindles on both sides.

Fig. 2



Patents for this important invention have been secured in the United States and in the principal countries of Europe, the American patent bearing date May 8, 1860.

Further information in relation to it may be obtained by addressing George W. Wiggins, at Watertown, N. Y.

LETTER FROM OUR WASHINGTON HOUSE.

WASHINGTON, June 19, 1861.

You have recently noticed with favor the appointment of John L. Hayes to the office of Chief Clerk of the Patent Office. He is regarded as a gentleman of marked ability, and has received a legal education. He has, moreover, acquired some familiarity with the workings of the Patent Office, by some years' practice before that bureau in the capacity of attorney.

The labor of systematizing the printing of the Letters Patent, as required under the new law, goes steadily on, but some weeks must yet elapse before the printed copies can be made ready for prompt delivery week by week. The entire weekly issues from the 5th of March to the 4th of June, inclusive, are now in the hands of the printer. The first will probably be ready for delivery shortly after the 1st of July. We have seen some of the proofsheets, and find them to present a very creditable appearance. The exchange of accurately printed copies of patents for the "scratched" and interlined and ofttimes incorrect manuscript copies which have been formerly provided, will be hailed with joy by all who are accustomed to consult or use such documents.

Knowing the importance to your numerous readers of the prompt and regular publication in your columns of the claims of patents granted, we continue to urge forward their dispatch as promptly as possible. When the printing office shall have systematized its portion of the labor, the Patent Office will not be behindhand; but with the issues of thirteen weeks in the printer's hands at once, confusion and delay are unavoidable. It is the intention to have the printed copies ready before the close of the week in which the patents are issued; and when this is done, there will be no difficulty in your having the claims in time for prompt publication, as heretofore.

One highly beneficial feature of the new system will be the demand for accuracy and artistic skill in the preparation of drawings, and correctness and perspicuity in the preparation of specifications. The eighth section of the new patent law, approved March 2, 1861, gives authority to the Commissioner to "require all papers filed in the Patent Office, if not correctly, legibly and clearly written, to be printed at the cost of the parties filing such papers;" and we are assured that this, as well as the twentieth section of the new "rules and directions" (relating to drawings), will be rigidly enforced as soon as the officials having the matter in charge shall be able to do so. "Large bodies move slowly," and reforms in such an institution as the United States Patent Office cannot be perfected in a day, much as their necessity may be felt. Certain it is that the public have long enough been subjected to the injury and inconvenience of patents granted under the seal of the United States, which are based upon faulty drawings and specifications, and the sooner this great evil is ended the better it will be for all parties.

Letters Patent of the United States have just been awarded to Willis E. Moore, of Crawfordsville, Ind., for an improvement in cartridges for large guns, the object being to so construct the metallic casing of the cartridge that it will be automatically discharged from the gun simultaneously with the flight of the ball.

The cartridge is used in the same manner as the ordinary bag cartridge, and only differs from it in being metal cased and in the form of a cone, with two weak points in its sides. It is inserted at the muzzle, point first, so that the apex of the cone comes against the breech, having around it an air chamber in the rear of the ball and cartridge. When the charge explodes, the gases, passing through the weak points in the casing into the air chamber, instantly expel the casing from the gun after the ball.

Practical test of the invention proves that it effectually accomplishes the object in view, and obviates the necessity of swabbing. It will therefore prove a valuable improvement.

Mr. Moore recently visited this city for the purpose of laying his invention before the government, and received a permit from the Ordnance Bureau to experiment with it at West Point.

Variable Springs in Wisconsin.

MESSRS. EDITORS:—In answer to a former communication, you remark in a late number that you cannot answer my queries in regard to the rising of water in our lead mines during the prevalence of southerly winds, without knowing the geological character of this country. I will, without further delay, offer a very brief and simple theory of my own, to account for this apparently mysterious "rising of the waters."

From a careful consideration of the subject, this increased flow of the water from sources below the earth's surface, and cut off from a free communication with the external air, is brought about by the diminished pressure of the atmosphere during warm southerly winds; whilst the elastic force of the common air or other elastic gases which are in contact with the subterranean sources of our springs, does not change simultaneously with the changes constantly taking place above the earth's surface.

Consequently when a part of the atmospheric load, as indicated by a barometer, is suddenly removed from the boiling fountain, the air pressure underground being the same, an increased flow of the waters for a limited time is the inevitable result. W. N. R.

Lancaster, Wis., June 10.

Lambertville Contributions.

MESSRS. EDITORS:—The ever welcome SCIENTIFIC AMERICAN came duly to hand, and was not long in telling its readers that you favored our town with a special notice in regard to the patriotic contributions. I have been courtmarshaled for incorrect reporting in that case. I meant to say, and am certain I did say, that our citizens had subscribed one thousand dollars per month. Your paper made it read one hundred dollars. It is a matter of little account to the public; but as a point of history, facts, &c., it is an odds of 9 to 1, which is quite an item to poor folks. I care more about it from the fact that very much of the good patriotism has been produced by the energy of our ladies. T.

Lambertville, N. J., June 6, 1861.

The Flag.

MESSRS. EDITORS:—In the SCIENTIFIC AMERICAN, No. 18, you give the proportions of the American flag, which differs materially from that authorized by the government, which is as follows:—The garrison flag is the national flag; it is made of bunting, thirty-six feet fly and twenty feet hoist, in thirteen stripes of equal breadth, alternately red and white, beginning with the red. In the upper quarter, next the staff, the Union, composed of a number of white stars, equal to the number of States, on a blue field, one-third the length of the flag, extending to the lower edge of the fourth red stripe from the top. The storm flag is twenty feet by ten feet; the recruiting flag, nine feet nine inches by four feet four inches. "U. S. Army Regulations," page 456.

HENRY A. COOK.

Newport, R. I., June 10, 1861.

A SOUTHERN merchant wrote lately to a large firm in New York, requesting a list of the names of those who supported and sympathized with the "movement against the South." The New Yorker replied by sending through Adams & Co.'s Express, a copy of the "City Directory."

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Experiments with Ordnance---Effects of Projectiles on Iron Plates.

Some very interesting experiments, going to show the effects of projectiles upon iron plates, were made on the 7th inst. at the proving grounds near Pittsburg. The *Chronicle* states that a 12-pounder gun was loaded with a charge of six pounds of powder and a 12-pound ball, and discharged at a plate of iron, furnished from the works of Mr. Shoenberger, nearly five inches in thickness, and about two feet square. The plate was made up of six distinct plates, all bolted together, and manufactured from excellent iron. The effect of the shot was almost incredible. The distance between the gun and target was not measured, but was probably nearly 100 yards. At this distance the 12 pound shot penetrated three plates of the Shoenberger plate, dished the whole mass several inches, and partially broke through the remaining three plates. The ball was crushed to fragments, and the front hemisphere evidently half fused. The same effect on the ball followed each shot. The second plate tested was solid, and four inches thick, of best Juniata iron. The ball penetrated about 1⅛ inches, and dished the plate less than in the preceding experiment. The third experiment was with a 2-inch plate, which the ball so nearly broke through that a light hammer would have removed the fragment. The plates, in all the experiments were simply set on edge, with no other support than was sufficient to keep them in that position. The 6-pounder was proved by two charges of solid shot and 1¼ pounds of powder.

While the experiments were going on, a gang of men had removed the columbiads from the cars, and set the entire lot (ten in number) in order for proving. Two of these guns were trained by the same gunner, with the same lack of means, on a fourth plate of iron, solid, about 18 inches wide, 3 feet long, and nearly 5 inches thick. The guns were loaded with 12 pounds of powder, solid, strapped shot, and wad. The cartridges were carefully picked, tuses affixed, and the lot touched off together, the heavy reports following in rapid succession. A cloud of smoke covers the muzzles, and a shower of sand the bank where the balls strike, and when these clear away, one or two heavy trees are found to have been knocked down. The lower half of the iron plate is half imbedded in the bank, with the half fused portion of the ball beneath it. The upper portion of the plates showed an indentation of about two inches, and a fracture completely through, further up the hill. The result of all the firing proves that at short range no ordinary or practicable iron sheathing would resist the power of columbiad shot. The second shot was fired with 15 pounds of powder and a shell, the guns were cleaned and inspected, and the day's work was done. In firing the columbiads, the breach was sunk in a slight excavation, in order to level the bore, yet such was the force of recoil that several of the guns jumped backward five or six feet. The work of inspecting and proving the guns on behalf of the government is now in the hands of Captain McNutt, who has been stationed for some time at the Alleghany Arsenal.

Steam Privateering Fleet.

While the press adverts in glowing terms to the immense blockading fleet equipping at the North, they seem to forget that the South has, at the present time, the materials of an immense privateer fleet, capable of committing serious depredations on our commerce, and seizing American vessels in the Gulf and the Caribbean Sea. A combination of this fleet of armed vessels on any one point where but few United States vessels are employed in a blockade, might result in the capture of the latter. We have prepared a table of the names of the vessels now at the South, under the control of the rebel government. Many of these vessels were formerly engaged in the Texas, Havana and Key West trade. The legitimate owners of six or seven of the steamers reside in New York, but the rebels have confiscated and appropriated them to their own use. The following is the list :—

Vessels.	Tuns.	Vessels.	Tuns.
Atlantic	623	Suwanee	494
America	372	Star of the West	1,172
Gen. Miramon	296	Tennessee	1,149
Galveston	945	Texas	1,125
Habana*	499	W. G. Hewes	1,100
Mexico	1,059	W. H. Webb*	500
Magnolia	843	Matagorda	425
Marquis de Habana	688	Calhoun*	525
Total tunnage			11,815

*Now armed and cruising in the Gulf of Mexico.

COOK'S ELASTIC SPRING BED BOTTOM.

One of the wonderful discoveries of this century is the fact that so hard a metal as steel makes the very softest chair, sofa or bed. Since the introduction of spiral springs in the manufacture of seats and beds, several plans have been proposed for using the same material in either lighter or cheaper form, and one of the most novel of these is represented in the accompanying engraving.

Fig. 1

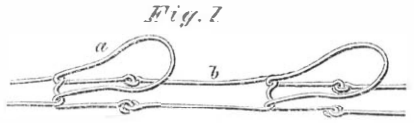
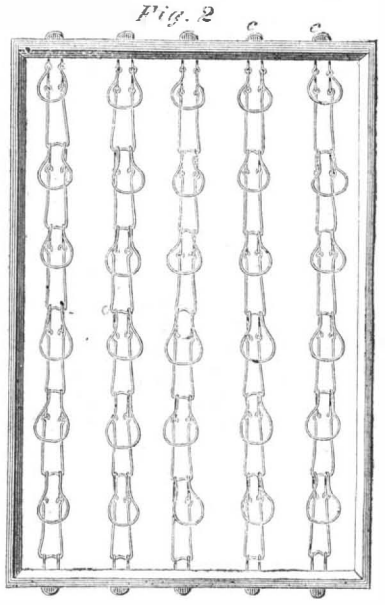


Fig. 2



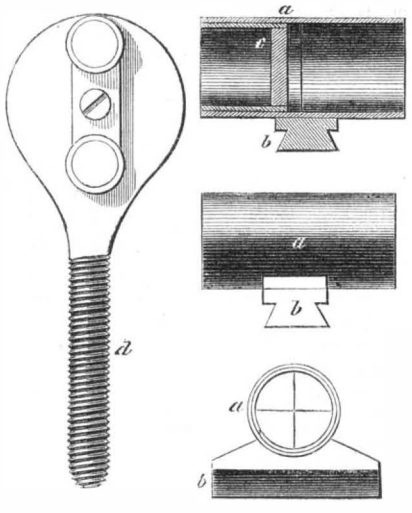
A series of chains, formed of the bent loops, *a*, and connecting links, *b*, in the manner plainly shown in fig. 1, are stretched across a rectangular frame from end to end, as represented in fig. 2. The chains are stretched to a proper tension by wedges, *c c*, at their ends; and they are so arranged that all of the loops will be inclined in the same direction, as shown.

It seems to us that this is one of the best plans for a bed bottom that has been invented. It is light, cheap, simple and easily made.

The patent for this invention was obtained through the Scientific American Patent Agency, May 21, 1861, and further information in relation to it may be had by addressing the inventor, W. C. Cook, at Appleton, Wis.

VALLANCE'S TELESCOPIC SIGHT FOR RIFLES.

Any person who has practiced firing rifles at long range, is aware that one of the principal difficulties in obtaining accurate aim is the impossibility of seeing a distant object of small size through the sights. It has long been common to employ telescopes on



heavy rifles intended for very long range, but as ordinarily constructed they are cumbersome and inconvenient, and we have often wondered why some ingenious inventor did not arrange the lenses on the rifle barrel without any connecting tube. We now find in the *Mechanics' Magazine* the following description of this very arrangement. It seems to us that it would be better to surround the back sight as well as the fore sight with a short tube; though if the plan here represented makes a clear and powerful glass it is more simple and therefore better :

The invention consists in combining with a rifle or other fire-arm, or with a piece of ordnance, a telescope on the Galilean principle, and having cross wires or other suitable sighting-points near the object glass of the telescope. The arrangement the patentee prefers is this:—He employs as a foresight a tube or frame containing cross wires, and immediately behind the wires he places a convex lens. For the back sight of the telescope or plate or disc is employed, having a small perforation in it through which the sight is taken, and so arranges the plate or disc that the perforation can be adjusted in position to give the requisite elevation for different ranges. Near or on this perforated disk a concave lens is placed, so as in combination with the lens of the foresight to form a Galilean telescope. On looking through the perforated disk the cross wires of the foresight will be clearly seen, and their point of intersection may be made to cover any object which appears in the field of view of the telescope.

The annexed engraving illustrates the foregoing :—*a* is a short tube attached to the muzzle of the rifle; *b* is a dovetail attached to the tube, and which entering a corresponding notch in the muzzle of the barrel sustains and holds the tube in its proper position; *c* is a magnifying lens, the focal length of the lens should be for a long Enfield rifle 48 inches; cross wires are placed in the tube immediately in front of the lens, or in place of these cross wires the ordinary sight may be employed. The tube, *a*, in this case not carrying the cross wires, but being arranged so that the lens may come immediately behind or before the foresight of the rifle. *d* is the back or elevating sight of the rifle, this is screwed into the stock and caused to project a greater or less distance from the stock according as the range at which it is desired to shoot is long or short; the stem of the sight being graduated it is easy (by turning it in one or other direction) to bring it to the elevation required for any given length of range. There is a small perforation in it, through which the sight is taken in aiming. This hole is made as small as it can be made to allow a sufficient amount of light to pass to the eye. Immediately behind this aperture a concave lens is placed, of the power requisite to produce clear vision for the rifle shown. A No. 4 spectacle lens for short sight is suitable : the same will also do well for a long Enfield rifle. In the arrangement shown, the back or elevating sight is shown fitted with two lenses; they are mounted on arms which turn about a center, so that one or other of the lenses, as desired, can be brought opposite the aperture. The object of thus employing two lenses is, that they may be made of somewhat different focal lengths, and then the person using the piece will select the lens which he finds best suited to his sight. Sights similarly constructed are suitable for other fire-arms and for ordnance.

Care for Soldiers.

In the Crimea, the troops which resisted privations and fatigue most successfully, were those commanded by colonels who were careful of their soldiers. For example: of two regiments which left the camp of St. Omer at the same time, arrived together in the Crimea (in the month of October, 1855), encamped side by side, having submitted to the same atmospheric vicissitudes and performed like service, one of them had preserved, on the 1st of April, 1855, 2,224 soldiers, out of a force of 2,676 men; whilst the other, with a force of 2,327 men, had left to it only 1,239. This account includes those who died from disease, and not from wounds received in battle. In the navy the commander of a vessel watches over the composition of the food of the crew, and moreover, respects scrupulously the hour for breakfast and that for dinner; never is it delayed, anticipated or interrupted.

It is desirable that the same scruples should pervade the army, and that these wise measures for the preservation of health should never be infringed without a clear and absolute necessity. Rewards are given to colonels of cavalry in whose squadrons is preserved the greatest number of horses, which results in an excellent and profitable emulation. Similar results, but still more important and happy, would be experienced, if like rewards were bestowed upon the colonels whose battalions were distinguished for the healthy condition of the men.

BLESSINGS OF SECESSION.—A correspondent, writing from Texas, says :—

Owing to the present national difficulties, Northern travel, as a matter of course, has fallen off, and it leaves some of our principal hotels in rather an embarrassed state. The hotels in this city have been supported almost entirely by Northern custom; now that prop fails them, their prosperity ceases. The Island City House, the finest in the city, is about to succumb to the hard times; the Tremont House, a fine hotel, will soon follow. The Strand, the principal business street of this city, which, at this time of the year has been usually lively, now looks deserted and lonely. Business in this city is perfectly stagnated. Merchants are disheartened, and most of them are closing out their stocks at an immense sacrifice. There is no sale for any thing but corn, bacon, and flour, and these are held by speculators at enormously high prices.

PREPARATIONS FOR A CAMPAIGN.—The Acting Quartermaster-General has ordered the construction of one thousand wagons for the use of the army, to be equally divided among ten different manufacturers.

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THE WAR.

GOVERNOR JACKSON, OF MISSOURI, PROCLAIMS WAR AGAINST THE COUNTRY.

Claiborne F. Jackson, the Governor of Missouri, though professing allegiance to the United States government, is said to be at heart a zealous secessionist, and this report is abundantly proved by his acts. The legislature at its recent extra session passed a military bill for organizing and arming the militia of the State, but General Harney, the commander of the Federal forces in Missouri, seeing that, in the hands of Governor Jackson, this law would amount to merely a scheme for arming the secession party in the State for the purpose of driving out or silencing the Unionists, declared it unconstitutional, and demanded that its execution should be suspended. An agreement based on this suggestion was made between General Price, the commander of the State militia, acting on the part of Governor Jackson and General Harney, which we have already published. The administration at Washington, learning that Governor Jackson was actively organizing the secessionists under the name of the State Guard, and that Union men were daily being driven out of the State, became satisfied that General Harney, who is an honorable old soldier, was being overreached by the plotting traitors with whom he had to deal. They therefore decided to appoint him to some other post, and to give the command in Missouri to General Lyon, who is next in rank. General Lyon has been stationed at St. Louis, a commercial city of 166,000 inhabitants, situated on the west bank of the Mississippi river, which bounds the State on the east. The Missouri river runs directly through the middle of the State from west to east, and empties into the Mississippi 20 miles above St. Louis. The capital of the State, Jefferson City, is on the south side of the Missouri river, 125 miles west of St. Louis, the places being connected by the Pacific Railroad. The secessionists have by their activity obtained the control of most parts of the State of Missouri, while in St. Louis the sentiment is overwhelmingly in favor of the Union. General Lyon immediately made the offer to the Unionists in the several places in the State that, if they would organize themselves into military companies, he would furnish them with arms. The offer was promptly accepted and the organizing and arming of the Union party has been going on with great energy. Governor Jackson, seeing that this process was soon to put the physical power in the hands of the Union party, endeavored to stop it by negotiation. He accordingly sent word from Jefferson City that he would visit St. Louis for the purpose of making an arrangement with General Lyon if the latter would guarantee him from arrest, which he seems to have feared, on the charge of treason. The guarantee being given, he took the cars in company with General Price and proceeded to St. Louis, where he had an interview with General Lyon on the 11th of June. He offered to disband the State Guard if General Lyon would disarm the Union men and intrust their protection to Governor Jackson. The offer was not accepted. General Lyon told Governor Jackson in a decided and emphatic manner that the United States had and intended to hold supreme jurisdiction over Missouri—that the Federal government intended to maintain its right to place Federal troops upon any portion of the soil of Missouri, wherever the public interests should require—that it was the intention of the government to afford full protection to loyal men in Missouri, and that if any driving out was to be done, the persons driven out should be none but traitors. He further told Governor Jackson that the State militia must be abandoned, for the law under which they were mustered was notoriously hostile to the Federal interests. The governor returned to the capital, and on the following day, June 12th, he issued a proclamation giving a history of the negotiation. After stating at great length what offers he made, he says :—

They were rejected by the Federal officers. They demanded not only the disorganization and disarming of the State militia, and the nullification of the military bill, but they refused to disarm their own Home Guard, and insisted that the Federal government should enjoy the unrestricted right to move and station its troops throughout the State whenever and wherever that might, in the opinion of its officers, be necessary, either for the protection of loyal subjects of the Federal government or for repelling invasion; and they plainly announced that it was the intention of the administration to take military occupation, under these pretexts, of the whole State, and reduce it, as avowed by General Lyon himself, to the exact condition of Maryland.

The document concludes with the following proclamation of war against the government :—

Now, therefore I, C. F. Jackson, Governor of the State of Missouri, do, in view of the foregoing facts, and by virtue of the power vested in me by the constitution and laws of the Commonwealth, issue this my proclamation, calling the militia of this State, to the number of 50,000, into active service of the State, for the purpose of repelling such invasion and for the protection of the lives, liberties and property of the citizens of this State, and I earnestly exhort all good citizens of Missouri to rally to the flag of their State for the protection of their endangered homes and firesides, and for the defence of their most sacred rights and dearest liberties.

In issuing this proclamation, I hold it to be my most solemn duty to remind you that Missouri is still one of the United States; that the Executive Department of the State government does not arrogate to itself the power to disturb that relation. That power has been wisely vested in the Convention, which will, at the proper time, express your sovereign will; and that, meanwhile, it is your duty to obey all constitutional requirements of the Federal government. But it is equally my duty to advise you that your first allegiance is due to your own State, and that you are under no obligation whatever to obey the unconstitutional edicts of the military despotism which has introduced itself at Washington, nor submit to the infamous and degrading sway of its wicked minions in this State. No brave-hearted Missourian will obey the one or submit to the other. Rise, then, and drive out ignominiously the invaders who have dared to desecrate the soil which your labors have made fruitful, and which is consecrated by your homes.

CLAIBORNE F. JACKSON.

THE MOVEMENTS OF GENERAL LYON AGAINST GOVERNOR JACKSON.

On the same day on which the proclamation of Governor Jackson was issued, General Lyon put a body of his troops, with a section of artillery, on board of four steamboats—the *Jatan*, the *January*, the *Louisiana* and the *J. C. Swan*, and started up the Missouri river for Jefferson City. At the same time a detachment was sent out on the Pacific Railroad to co-operate in the expedition.

THE FLIGHT OF GOVERNOR JACKSON.

After issuing his war proclamation, Governor Jackson fled from Jefferson City, burning the railroad bridges behind him. One of the bridges destroyed by this flying governor is the Gasconade Bridge, about 90 miles from St. Louis, which cost $50,000. He also succeeded in burning the west span of the Osage bridge, nine miles east of Jefferson City. He has fled to the western part of the State, and General Lyon, at last accounts, was in pursuit no more than 24 hours behind. Four hundred loyal troops from Illinois are concentrated at Hannibal, in Missouri, and great numbers are ready to follow if their services shall be needed.

THE ADVANCE ON HARPER'S FERRY.

Our account last week left the government troops advancing on Harper's Ferry from three directions—one corps under General McClellan, from the west; one from the north, under General Patterson; and one from Washington, on the southeast. As the column from the west is moving along the Baltimore and Ohio Railroad, the bridges of which have been destroyed by the secessionists, its progress is slow. On the 11th of June, the advance of the western column being at Cumberland, 97 miles west of the Ferry, Colonel Lewis Wallace, with a portion of the Indiana regiment of Zouaves, left Cumberland for Romney, Va., 22 miles distant, where he surprised, and after a sharp conflict completely routed, 500 secession troops, capturing some prisoners, killing two, wounding one, and taking some first class camp equipage, provisions and medical stores. The victors returned to Cumberland the same day. The advance from Washington proceeded up the left or Maryland bank of the Potomac to Conrad's Ferry, nearly opposite Leesburg, in Virginia. Some slight skirmishing occurred with the rebel troops as our forces advanced, but no fighting of any consequence.

In the meantime General Patterson's column continued to advance from the north, threatening, in combination with the corps from the east and west, to envelope the secessionists at Harper's Ferry and capture them.

THE EVACUATION OF HARPER'S FERRY.

The rebel leaders, seeing this large body of their troops in such danger of capture, decided upon the very important step of withdrawing them, thus commencing a retrograde movement which must be fatal to their cause. They had about 2,000 troops on the Maryland side of the Potomac, opposite Harper's Ferry. These were withdrawn on the night of June 12th, and at four o'clock on the morning of June 13th they set fire to the bridge across the Potomac and commenced their retreat, a portion of them at least proceeding by way of the Winchester and Potomac Railroad, which leads from Harper's Ferry southwesterly 32 miles to Winchester. Cars were loaded with baggage, and, as the soldiers marched, a portion of them pushed the cars along by hand. The whole day of the 13th was occupied in evacuating the place and in destroying the property, both of the United States and of the Baltimore and Ohio Railroad. A correspondent of the Baltimore *American* gives a very graphic description of the conflagration, from which we make the following extracts :—

The attention of the visitor is, of course, first directed to the ruins of the noble bridge which lately spanned the river, the destruction of which has been complete, with the important exception of the piers. These rear their heads firmly above the waters, apparently uninjured, beyond the upper layer of granite, and which appears to have crumbled beneath the intense heat of the flames. The iron or "Winchester span" of the bridge, connecting the covered portion of the structure with the town, has also been left standing. The possession of the piers will render the reconstruction of the bridge of easy accomplishment, though it is doubtful whether the new structure will equal in beauty or grandeur that which was given up to the flames. The work of rebuilding will be commenced on Monday, and will be vigorously urged to a speedy completion.

The piers are supposed, by residents of the town, to have been purposely spared, as there is not the slightest indication of their having been mined or their destruction otherwise attempted. Upon the remaining iron span of the bridge is standing a large six-wheel engine, of the Baltimore and Ohio Railroad Company, No. 165, which the Kentuckians attempted to run into the river, but were prevented from doing so by Colonel Steuart, of Baltimore, it is said.

The railroad company has sustained a further serious loss, in the destruction, also by fire and gunpowder, of the graceful iron tresseling, over which the track was laid, from the bridge to the end of the government works—a distance of about half a mile. About 300 feet of this work, extending from the bridge to the water station, near which Mayor Beckam was shot and killed by one of John Brown's party, was left untouched, through fear of injuring the Wager House and other private property near it. The telegraph office and railroad office were also spared through similar motives.

The Rifle works, situated in a different section of the town than the Armory; the splendid quarters of the Master Armorer and other officers, near Bolivar, and a magzine in the same village, were all left untouched; but it was extensively rumored and believed at Harper's Ferry on Saturday, that a detachment of troops would return that night to complete the work of destruction.

The light and graceful suspension bridge across the Shenandoah had been entirely covered with tar and other combustibles, as if preliminary to its destruction, but the authorities appear to have subsequently changed their designs, for the single match alone required to consign it to the flames was not applied.

An eye witness of the conflagration describes it to have been terribly grand, presenting alternately the appearance of a vast flaming furnace, and anon, as the flames undulated, like a whirlwind of tempestuous fire.

During the closing scenes of the conflagration, and when it was feared the fire would go beyond control and destroy the town, several thousands of muskets were discharged into the flaming mass, for the purpose, it is said, of scattering the embers and thus lessening the intensity of the heat, the reports continuing with the incessant tolling of the bell in the tower of the new shop, lent to the proceedings an effect indescribably solemn and thrilling, and which awoke in the breast of my informant an emotion which he could only liken to terror.

CONCENTRATION AT MANASSAS JUNCTION.

The secession forces that left Harper's Ferry retreated to Manassas Junction, where a considerable body of rebel troops had been for some time entrenching themselves. This place is on the line of the Orange and Alexandria Railroad, 27 miles southwest of Alexandria, and some 32 or 33 miles from Washington. The largest body of troops which the secessionists have are now concentrated at this point, and it will be the theater of the next important operations. Whether the rebels will stand at bay here and give battle, or whether they will be so threatened by overwhelming numbers as to be compelled to retire, as they were at Harper's Ferry, remains to be seen. The process has commenced, however, of rolling the rebellion back toward the Gulf, and there would seem to be no reasonable doubt that it will steadily continued until it is consummated.

THE BATTLE OF VIENNA.

The Alexandria, Loudon and Hampshire Railroad runs from Alexandria northwest 37½ miles to Leesburg. On Monday, June 18th, General McDowell, the commander of the Federal troops opposite Washington, ordered Brigadier-General Schenck to station guards along the line of this road. He accordingly took the First Ohio Regiment, commanded by Colonel McCook, who was recently teacher of infantry tactics at West Point, and proceeded in a train of cars from Alexandria, stationing detachments at the commanding points along the road. As the train, having four companies remaining on board, approached Vienna, which is about 15 miles from Alexandria, it was fired

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upon by a masked battery planted at a curve in the road. The engine was pushing the train before it, and the coupling between the car next to the engine and the remainder of the train was cut off by a cannon shot, so that the train could not be drawn back out of fire. General Schenck and Colonel McCook, who were both aboard of the train, ordered the men to scatter right and left into the woods. The engineer run his train with the one car back to Alexandria, and the men were consequently obliged to retreat by foot, carrying their wounded on litters through the woods some five miles. The attack was made at about half-past four o'clock in the afternoon. General Schenck, in his official dispatch, reports his loss at 5 killed, 6 wounded and 10 missing. Later news represents all things quiet at Vienna; that the rebels had retired, and that about 5,000 Union troops, with a battery, were concentrated at that spot.

PRIVATEER CAPTURED.

Jefferson Davis is endeavoring to promote privateering upon the unprotected commerce of the United States by the issue of letters of marque. This he has effected to a very limited extent, his trouble now being that he has no seaports into which he can run the prizes. The first vessel commissioned for this purpose was the schooner *Savannah*, from Charleston, S. C. She went to sea on Sunday, 3d June, and the next day fell in with the brig *Joseph*, of Rockland, Maine, from Cardenas, Cuba, with a cargo of sugar consigned to Welch & Co., Philadelphia. The *Savannah* set her colors so as to deceive the *Joseph*, and the latter hove to, and her captain went aboard the piratical craft, under the impression that she was in distress. No sooner had he done so than the captain of the *Savannah* said, "Your vessel is taken as a prize under the authority of the Confederate States." Eight men were put aboard the *Joseph*, and they were directed to take her and her crew to the nearest port, which was that of Georgetown, S. C. Soon after the *Savannah* and *Joseph* parted company, the brig *Perry*, a man-of-war, hove in sight a little north of the Hole in the Wall; but as her guns were run back, her port holes closed, and the vessel otherwise purposely disguised, she was mistaken for a merchantman, and the pirates, flushed with their recent success, and with so inviting a prospect of plunder before them, full of great expectations, made all sail for the supposed prize. They had got within a mile of the brig before they discovered their blunder, when they put about, more anxious to escape than they had been before to make the seizure. The *Perry* at once gave chase, and fired several shots, four of which were returned by the 18-pounder of the privateer. Two of the shots from the *Perry* went through the foresail of the pilot boat; the shots of the *Savannah* did not take effect. The next occurrence was the surrender of the pirates, who were taken on board the *Perry*, and were subsequently transferred to the *Minnesota*, lying off Charleston, where they were put in irons. The *Minnesota* put a prize crew of seven upon the *Savannah*, Midshipman McCook commanding, and they brought her to New York and anchored off the Battery.

The number that originally shipped on the *Savannah* was thirty-two, but eight deserted before she put to sea. There were, therefore, twenty-four aboard when the *Joseph* was captured, and eight having been transferred to her, leaves sixteen in irons on the *Minnesota*. One, however, was on the *Savannah*. He says that he belongs to this city, and was impressed into the service, which is not improbable. The 18-pound swivel amidships looks quite formidable. There is a large quantity of shot and shell, grape and canister, aboard. The pirates were, beside, armed with cutlasses, knives, pistols, muskets, rifles, &c. The cabin, in fact, is the very picture of a piratical den, with these death-dealing instruments hanging up about the walls. They had also a quantity of handcuffs for prisoners. These men are to be brought to New York and tried for piracy. May this be the fate of all privateers.

DISTRESS AT MANASSAS.

The following is from a letter written from Manassas Junction to the Richmond *Whig*, under date of June 3d:—

We are drilled pretty hard for this warm weather, but manage to endure it. The commissary stores are bad, but perhaps this is unavoidable at present.

The real evil, however, and one easily corrected, is the working day and night in digging trenches and throwing up fortifications of dirt by men unaccustomed to labor. In cold weather it might be stood, but in hot weather, the result is already seen in quadrupling the sick list.

The volunteers have seen in the newspapers that many wealthy gentlemen have tendered their negroes for these labors, and they know that there are thousands of free negroes who might be so employed. I really believe that if this state of things continues ten days, there will be at least one-fifth of the force here on the sick list or dead, for we have no real hospital here, and medicine is as scarce in the surgical department as money in the camp. Beside this, it is difficult to get water enough to drink, and even officers cannot get it. Water is guarded and given out as provisions are given out. These are absolute facts. Cleanliness is essential to recovery from camp diseases, and without water cleanliness is impossible, especially in warm weather. On this very day some forty sick had to be sent to Culpepper Court House.

BATTLE AT BOONEVILLE, MO.

Just as we were going to press the following account of a severe battle at Booneville, Mo., was received by telegraph:—Gen. Lyon, at the head of United States troops, landed four miles below Booneville and opened a heavy cannonade against the rebels, who retreated and dispersed into the adjacent wood, whence, hidden by brushwood and trees, they opened a brisk fire on our troops. Gen. Lyon then ordered a hasty retreat to the boats, and the rebels, encouraged by this movement, rallied and followed the troops into a wheat field. Gen. Lyon halted, faced his troops about, and, bringing the whole force of his artillery to bear, opened a murderous fire on the rebels, 300 of whom were killed, and the balance fled in all directions, leaving their arms on the field. Gen. Lyon then moved forward and took Booneville. Gen. Price was seized with violent diarrhea at the beginning of the battle and was taken on a steamer and carried to his home. Governor Jackson viewed the battle from a distant hill and fled for parts unknown after the defeat of the forces. There is great rejoicing among the Union men in Jefferson, who have hoisted the stars and stripes on the capital; guns were fired, and the "Star Spangled Banner" was played by regimental bands. Scouting parties were sent out in all directions to cut off the retreat of the rebels. John Fitzpatrick, one of the most violent secessionists of the State, took the oath of allegiance to the United States government in the presence of all officers in Jefferson.

The Pay and Pension of our Volunteers.

The following recapitulation affords useful information to volunteers and their families:—

I. After being mustered into the service of the United States, volunteers are entitled to pay the same as regular troops.

II. If disabled by wounds received in service or disease contracted in service, they are entitled to an invalid pension during life, or as long as the disability continues.

III. If any are killed or die in the service of the United States, leaving a widow, she is entitled to what pay was due her husband, and a pension. If there is no widow, the child or children of such volunteer are entitled to the pay, and a pension until they are sixteen years of age.

IV. If there is no widow or child under sixteen years of age, the other heirs of decedent are entitled to the pay due the volunteer at the time of his death—no pension. At this time neither the volunteers nor any heir is entitled to land warrants, but there is no doubt an act of Congress will be passed early in July granting one hundred and sixty acres to every volunteer who shall serve fourteen days, or engage in battle and be honorably discharged—first to the widow, second to the children, third to the mother, fourth to the father; and, if all of the foregoing heirs be dead, fifth, the brothers and sisters of those who may so serve and die without receiving a warrant—in like manner as the volunteers who served in Mexico are now rewarded. Seamen and others who take prizes, and those performing meritorious feats, will undoubtedly be rewarded with the fruits of their valor. Those patriotic men and women who suffer from robbery in the slave States, under the name of confiscation, will almost certainly be rewarded—according to the Scripture rule—four-fold from the property of the rebels—all State confiscations being wholly illegal—and mere organized piracy will be punished, and Congress will undoubtedly pass a proper and effectual act whereby the United States Courts will take from the unfaithful and unjust stewards what property they may have and give it to the faithful and true servants.

V. In addition to what the volunteers and heirs are entitled to and may become entitled to from the United States, the several States have passed and will pass acts granting pay from the State Treasury.

BALLOT OR BULLET.—The man who never votes has paid a visit to the man who never shouldered a musket; after deciding that the country is half ruined, and their own business wholly so, the two concluded that the ballot box and the cartridge box were essential to the prosperity and safety of the strong box.

A correspondent of the London *Morning Post* states that in Central America there are plenty of fibrous plants from which the natives make cloth superior to that obtained from cotton or flax. The fibers from these plants are of various degrees of fineness, and range from 8 cents to 48 cents per pound.

A Great Sepoy Loose---Proclamation of General Beauregard.

The *Richmond Enquirer* contains the following proclamation from General Beauregard:—

HEADQUARTERS, DEPARTMENT OF ALEXANDRIA,
Camp Pickens, June 5, 1861.

A PROCLAMATION—*To the People of the Counties of Loudon, Fairfax and Prince William.*

A reckless and unprincipled tyrant has invaded your soil. Abraham Lincoln, regardless of all moral, legal and constitutional restraints, has thrown his abolition hosts among you, who are murdering and imprisoning your citizens, confiscating and destroying your property, and committing other acts of violence and outrage, too shocking and revolting to humanity to be enumerated.

All rules of civilized warfare are abandoned, and they proclaim by their acts, if not on their banners, that their war cry is "Beauty and Booty." All that is dear to man—your honor and that of your wives and daughters—your fortunes and your lives, are involved in this momentous contest.

In the name, therefore, of the constituted authorities of the Confederate States—in the sacred cause of constitutional liberty and self-government, for which we are contending—in behalf of civilization itself, I, G. T. Beauregard, Brigadier-General of the Confederate States, commanding at Camp Pickens, Manassas Junction, do make this my proclamation, and invite and enjoin you by every consideration dear to the hearts of freemen and patriots, by the name and memory of your revolutionary fathers, and by the purity and sanctity of your domestic firesides, to rally to the standard of your State and country; and, by every means in your power, compatible with honorable warfare, to drive back and expel the invaders from your land.

I conjure you to be true and loyal to your country and her legal and constitutional authorities, and especially to be vigilant of the movements and acts of the enemy, so as to enable you to give the earliest authentic information at these headquarters, or to the officers under his command.

I desire to assure you that the utmost protection in my power will be given to you all.

Signed G. T. BEAUREGARD,
Brigadier-General Commanding.

Official—THOMAS JORDAN,
Acting Assistant Adjutant-General.

We invite our European readers especially to read the above proclamation with care. It emanates from the pen of General Beauregard, who is, next to Jeff Davis, the pride of the secessionists. We suppose this is what the *gallant* General would call one of the means "compatible with honorable warfare." The London *Times* will be shocked to learn that the President of the United States is a second edition of the atrocious Nana Sahib, supported by a band of Sepoys, who will confiscate, ravish and murder regardless of all "moral restraint." General Beauregard has evidently too much refinement in his composition to enumerate the revolting and shocking acts which are to be committed by the President. A "Sepoy" proclamation of General McClellan, of the United States Army, is published on page 371 of our present volume. We hope our readers will read it again, and compare it with the one published above. The difference is as marked as the cause in which these two Generals are engaged. Seriously, a more infamous document than the above proclamation of the "Brigadier" it would be hard to find. It is a sad commentary upon his own moral qualities, and an insult to the people to whom it is addressed. It is asserted on good authority that Beauregard's family is now somewhere in New England. He don't believe a word of his own proclamation.

Good Times in New Orleans.

A gentleman in New Orleans gives the following charming account of affairs in that city. It is difficult to see how they could be better:—

NEW ORLEANS, May 16, 1861.

I must write and tell you of the flush times we are enjoying to cheer you up, as I understand you are all shaking in your boots about seeing our King "Jeff" in New York with about two million troops. I assure you he has as many, and all well armed and well drilled, probably much better than your crack "Seventh." In fact, we will put our 208th City Regiment against them. Every man of our regiment is over eight feet long, and built in proportion; so stand from under! We have got the best and longest guns in the world, and at present we are casting guns in New Orleans at the rate of 100 per day that will carry a 400-pound shot over 12 miles. Besides all these things, we are very rich. The city is flooded with gold, so that it is a complete drug in the market. The banks will only take a little at a time, and we are obliged to use it for manufacturing purposes, such as ornamenting buggies. Our privateers have brought in hundreds of prizes; our navy is increasing so rapidly that we have scarcely room for them in the river. Two million bales cotton was shipped from this port to-day, leaving nearly six millions now on the levee. In fact, we are just beginning to realize the milk and honey effects of secession, and I think we can say "the Lord our shepherd *is*."

STEEL CANNON.—Messrs. Corning, Winslow & Co., of Troy, N. Y., are now making both cast-steel and semi-steel field and boat cannon, and are able to furnish them up to 1200 or 1400 lbs. each. If the demand justifies it, this company can supply cannon of much greater weight.

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Improved Conical Repeater.

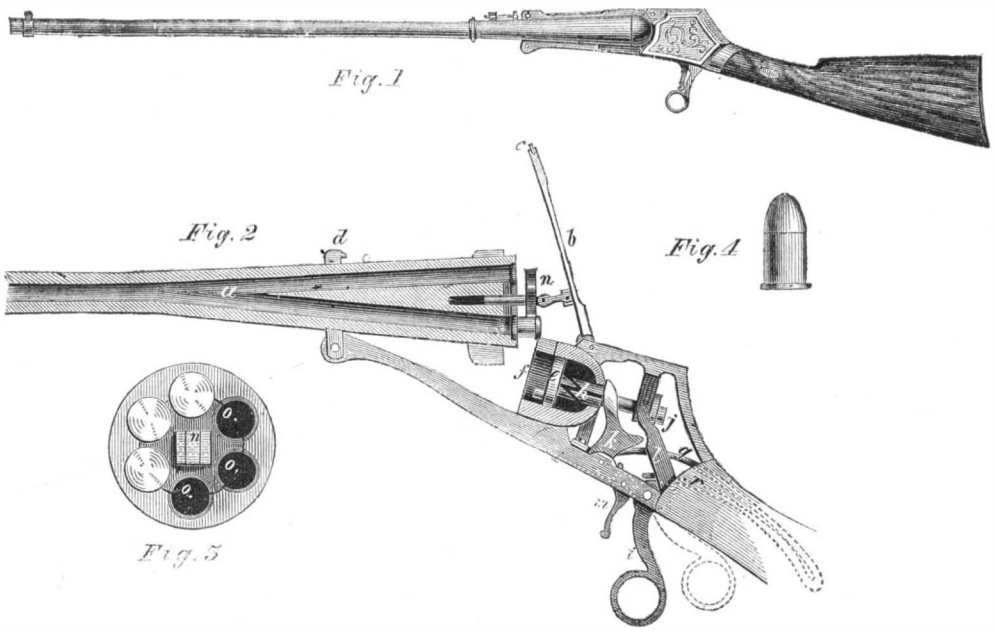
This firearm is one of the most remarkable novelties of our time. The importance of a rapid repeater, which should possess greater range and accuracy of aim than the pistol, has been so generally known, that much study has been bestowed upon the subject by inventors. But none of the constructions that have been offered to the public have met with much favor, on account of the danger to the left hand when grasping the barrel in the position of aim. At each discharge of a repeater which employs a revolving cylinder, there is a flash thrown out between the cylinder and barrel, which will cause the explosion of chambers not in line with the barrel, if they have not been loaded with great care, by forcing the ball in so as to be perfectly tight. The opening also causes a loss of power; and the dirt thrown on the cylinder frequently impedes the rotation. In the pistol these defects have been disregarded, as the weapon when fired is at arm's length, and the danger to the person using it is but slight.

To overcome these objections, the inventors of the arm illustrated here, employ a cone instead of a cylinder; the chambers, which make an angle of about five degrees with the axis of the barrel, converge and all lead into the barrel at one common point. There is, therefore, no escape of gas, no danger to the left hand, and no clogging of the machinery. The cartridge used is the improved metallic-case, waterproof now most in favor; so that the soldier need no longer tax his care to "keep his powder dry," as it is impossible to get it wet. Owing to the simplicity of its construction, the "conical repeater" can be made for a less price than any two-handed repeater now before the public.

Fig. 1 of the annexed cuts is a perspective view of this arm, and Fig. 2 is a vertical section of the chambers, and lock in the open position for loading. The barrel is enlarged in conical form at the lower end, and the bore divides at *a* into six branches, which diverge to the breech at an angle of about 5 degrees. The cartridge is represented at Fig. 4 attached to the shot. It consists of a cylinder of exceedingly thin copper filled with powder, and having a little percussion powder placed in the bottom. When the breech is raised nearly, but not quite, in the position shown in Fig. 2, one of these cartridges with the shot is slipped into each of the six branches of the bore, and the breech is then closed in the manner represented in Fig. 1, ready for firing; the lever, *b*, having a spring-catch, *c*, at its end, which catches under the hook, *d*, to hold the parts in place. The cartridge, having the fulminating powder in its end, is discharged by simply giving it a blow; and the lock of this gun, by which the several cartridges are struck in succession is novel, simple and ingenious. The short cylinder, *e*, is driven forward by the main spring, *g*, striking the projection, *f*, against the cartridge immediately in front of it, and as this cylinder is drawn back, it is turned one-sixth of a revolution, bringing the projection, *f*, opposite to the next cartridge. This turning is effected by the inclined grooves in the small cylinder, *h*, to which the cylinder, *f*, is secured; a stationary pin entering these grooves for this purpose. The cylinder, *h*, is drawn back by means of the bent lever, *i i*, the lower part of which is carried forward for this purpose, the upper end thus acting on the button or head, *j*. This same motion draws back the upper part of the tumbler, *k*, and thus bends the main spring, *g*, down into position to throw the cylinder, *h*, forward, and the force of the spring is further increased by drawing back the lower end of the lever, *i i*, thus pressing up the second or lower leaf, *l*, of the main spring. The tumbler is held in its back position by a catch on the trigger, *m*, and the gun is discharged by pulling the trigger in the usual manner Unless the trigger is pulled, the cylinder, *h*, is not rotated, so that merely cocking the piece without firing it does not carry the discharging projection, *f*, away from the cylinder in front of it. The disk, *n*, represented in Fig. 3, is introduced for the purpose of withdrawing the cartridge case after the explosion. It passes into the breech before the gun is loaded, and the semicircular notches, *o o o*, in its edge, are of such size as to allow the body of the cartridge to pass through them, but not to admit the passage of the enlarged rim around its bottom. Consequently when this disk is drawn back by the raising of the lever, *b*, the cartridge cases are pulled out of the breech as shown in Fig. 2. The lever, *b*, is depressed sufficiently to carry the disk, *n*, into the breech before the gun is loaded.

It will be understood that the six cartridges are introduced at one opening of the breech, when the gun is ready to be fired, as rapidly as any revolver.

The patent for this invention was granted through the Scientific American Patent Agency, January 24, 1860, and further information in relation to it may be obtained by addressing the inventors, Messrs. Morris & Brown, 107 Fulton street, New York.

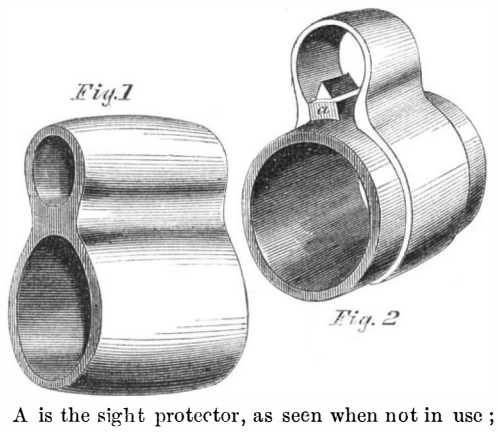


MORRIS AND BROWN'S CONICAL REPEATER.

SILVER'S RIFLE SIGHT PROTECTOR.

The accompanying engraving, which we take from the London *Mechanics' Magazine*, illustrates a new guard for rifles, recently invented by Messrs. Silver & Co., of Bishopgate. It is intended for a protection to the foresight of the rifle, not only from accidental injury, but, what is far more important, from the rays of the sun when firing.

It is so formed that when in use it allows the foresight to be seen without shadow in the tube of the protector. To explain this we must refer to the engraving.



A is the sight protector, as seen when not in use; B is a view of the same position on the barrel of the rifle; C being the sight as shown shaded from the light.

A much simpler shade than this for the fore sight of a rifle has long been in use in this country. It consists merely of a piece of Russia sheet iron bent into semi-cylindrical form, so as to grasp the rifle with a moderate force by its own elasticity.

Rifleman's Belt Rest.

A patent has been taken out in England lately by W. R. Taylor, of Oxford, for a pecular construction of rifleman's belt, to be used as a rest when firing. A strong piece of india rubber is introduced into a part of the belt to render it elastic, and that part of it nearest the left elbow is made slightly wider, and has a small opening in it. When firing, the point of the left elbow rests in the opening of the belt, and the arm which supports the rifle thus exerts a downward strain upon the belt. This, the patentee states, prevents the muzzle being thrown up when the charge explodes, and also gives steadiness to the aim of the marksman.

Holcomb's Electro-Magnet.

By the list of claims on another page, it will be seen that a patent has been issued to A. G. Holcomb, of this city, for an improvement in electro-magnets. This is based on a curious discovery made by him, by which, owing to the superior power of the magnet, the operators can dispense entirely with the relay battery. By connecting the cones of an electro-magnet with a permanent steel magnet, a force is developed greatly in excess of the sum of the forces of the permanent and electro-magnetism when used separately. Take, for instance, an electro-bar magnet,—pass a current of electricity through the helices sufficient to give it an attractive power equal to one ounce; then place in combination with it the north pole of a permanent steel magnet that has a magnetic power of ten ounces. The united power, however, instead of being eleven, which would be the sum of the two, would be twenty-three. As this gain is effected without additional cost, a fact established by numerous experiments, this discovery will go far in advancing electro-magnetism in the scale of useful motors, and will be exceedingly useful for telegraphic purposes, particularly for long lines.

American Rifled Muskets.

All the army rifled muskets which we have examined appear to have too light barrels. In this feature they resemble the Enfield rifle. We are aware that a certain length of rifle, with bayonet affixed, is necessary for charging and receiving charge; but an improvement may be effected without reducing the total length of rifle and bayonet combined. Take three inches from the length of barrel, and add the weight of metal that would thus be removed to the diameter of the barrel; this will increase its strength, insure more accuracy of aim, and enable the soldier to handle it more easily. The bayonet may be increased in length three inches without adding a single ounce to its weight; and by using the very best of metal its strength will not be diminished.

Grand Test Exhibition of Fire-arms.

We shall publish in our next issue the particulars of the proposal of the Illinois State Agricultural Society to have a grand national exhibition and test of firearms, and the list of premiums which this society proposes to award.

STEAM SUPERHEATING.—All the benefits obtained from superheating steam by passing it through tubes in a furnace before it is admitted into the cylinders, is stated to be obtained by keeping steam in a jacket surrounding the cylinder, and maintaining it at a temperature somewhat above that which operates the piston. It has been found in practice that the very dry steam which is produced in the tubes running through a furnace cuts the cylinders and packing. The London *Engineer* states that steam-jacketting has lately been introduced into the British navy, and has been applied to two vessels, the *Gibraltar* and *Atlas*. "In commercial steamers jacketted cylinders are being extensively adopted."

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NEW YORK, SATURDAY, JUNE 29, 1861.

THE END.

With this number ends Volume 4 of the New Series, also about 5,000 subscriptions. Many of these subscribers are in the seceded States and with whom we have no means of communication. We therefore urgently appeal to our friends in the loyal States to renew their subscriptions without delay, and induce some friends to join with them. We shall thus be encouraged to enter upon the new volume with a determination to make it in every way the most interesting, and valuable we have yet published. This is a time of stirring interest. The national government has entered upon a vigorous defence of its own existence. The inventive faculty of the nation will be fully aroused to devise and bring forward the most formidable projectiles of war, which is one of the great sources of power upon which the government must rely, and the loyal States have inexhaustible resources in this respect, of which its enemies are sadly deficient. We shall watch these matters with the closest attention, and carefully report every thing of interest connected therewith, and shall illustrate all the important improvements that are made in every department of the mechanic arts.

Through our correspondents in Europe, and by the aid of our excellent French, English and German exchanges, we are able to keep our readers thoroughly advised also of the progress which is being made in all foreign countries.

If industry and a desire to please our readers can bring success, then we shall hope to receive it. We shall do our best.

The SCIENTIFIC AMERICAN is the only journal now published in the United States devoted to the mechanic arts and popular science. Two volumes are published each year, costing but $1 each. The numbers for the whole year, costing but $2, contain 832 pages or 2496 columns of matter, mostly original, illustrated with hundreds of spirited engravings executed in the highest style of the art.

Our invariable rule is not to thrust our paper upon those who do not express a wish to receive it, and following out the rule which we laid down at the start, we shall stop sending it to those who do not renew. We hope all will renew. We shall reluctantly part with a single subscriber.

THE GREAT INVENTIONS OF THE LAST SIX MONTHS---HOW AN IMPORTANT INVENTION WAS SUGGESTED.

Notwithstanding the general diversion of the attention of the community to military matters, caused by the great Southern rebellion, we believe no former volume of the SCIENTIFIC AMERICAN contains the record of so large a number of valuable inventions as this which closes with the present number.

Of all these, the one of which the success is most assured, so far as we are at present informed, is F. F. Smith's simple invention for casting steel plows. A description of this will be found on page 154. Mr. Smith called on us last winter for the purpose of expressing his gratitude for the benefit which he had derived from the SCIENTIFIC AMERICAN. He told us the story of his life. He said that, after working a long time at his trade, he finally succeeded in starting in Ohio a little plow manufactory on his own account, which he was conducting in a very small way. One day, in reading his SCIENTIFIC AMERICAN, he saw an account of the casting of steel bells in England, and the thought occurred to him that he might cast the steel moldboards of his plows. The more he thought of it the greater appeared the advantages of the plan.

The moldboard could thus not only be fashioned in the exact form desired, but it could be made thickest in the parts most subject to wear. His patent we obtained for him after some difficulty after he had come to New York to consult us in regard to making arrangements for the manufacture of his plows. Believing that he had a valuable idea, we recommended him to apply to Mr. Collins, of the firm of Collins & Co., the celebrated ax manufacturers, for material assistance. This gentleman very promptly interested himself in the invention, and proceeded at once with the manufacture of the plows. Mr. Smith was to conduct the operation of casting, and he met with the very common experience of inventors, in encountering obstacles entirely unforeseen. In order to harden the steel the molds must be made of iron, and it was found that the molten metal would adhere as it hardened to the mold, and then, as it shrank in cooling, it would crack or warp. By skill and perseverance, however, these difficulties were surmounted, and a number of the plows were finished. Mr. Smith took these and started for Chicago, but the dealers whom he met on the way were so pleased with the article that he sold out his stock long before he reached his destination; and the fact that he was established in a prosperous and growing business was apparent. As he showed us one of his plows, he expatiated on those qualities that American mechanics are especially proud to exhibit in their work—plainness and simplicity, with accuracy of workmanship. "There is not an ornament about it," he said, "and every joint will pinch a hair."

There is another western invention described in this volume, which, though it has not yet passed into extensive use, seems to us to give promise of great results. We allude to Philips' carriage spring, illustrated on page 392. Besides these, the volume now closing contains descriptions of Crary's brick machine, Whipple's air engine, Wilcox's air engine, Millar's cork-cutting machine, Aiken's knitting machine, Wharton's turnouts for city railroads, Bowker & Bensel's stave machine, Victory's wool spinner, Hotchkiss', Cochran's and Sigourney's projectiles, Rodman's mammoth cannon, Dahlgren's howitzer, and many other inventions equally meritorious; some of those not named being likely to prove more valuable than any of these that we have mentioned.

With the increase in the number of our inventions, it is very gratifying to see a vast improvement in their quality. In place of pursuing perpetual motion and other kindred delusions, we find a constant increase in the number of our inventors who patiently study the laws of nature for the purpose of compelling her great forces to the service of man. In spite of foes without and within, in spite of wars and rebellions, the industrial and intellectual activity of the American people is carrying the nation steadily onward in civilization and power, and we strive to keep the SCIENTIFIC AMERICAN up with the progress of the times in every respect.

Give us your patronage, friends, and we will render you a full *quid pro quo* for all the money you invest with us, whether for subscriptions or for professional services in obtaining your Letters Patent.

EXPERIMENT WITH HAND GRENADES.

On Saturday, the 15th inst., a trial of a hand grenade, recently invented by W. F. Ketchum, of Buffalo, N. Y., was had at the foot of Fifty-first street, in this city. This street terminates at a precipice some 30 feet in hight, and has been finished with a masonry wall crowned with a parapet, making an admirable place for the experiment. The inventor had caused a pen about 12 feet square to be constructed of inch boards at the foot of the wall, down into which he hurled his grenades, standing behind the parapet to shield himself, as did also the company of spectators. The grenades are oblong shells of cast iron, filled with powder, their walls being about half an inch in thickness. A rudder or tail piece of stiff pasteboard is fastened at one end, so as to insure the flight of the projectile with the opposite end foremost, and a percussion cap is so arranged that when the forward end strikes the shell is exploded, throwing the fragments in every direction with great force. At the trial, every shell burst on striking, and the fragments (some of which weighed probably half a pound) were driven through the boards, especially shivering the floor where the shell struck into splinters.

The principal purpose of these grenades is to defend merchant ships against the attacks of privateers. As one man could throw at least 60 of them into a boat a minute, and as each one of the largest size is as destructive as a 5-pound bomb shell, they are very formidable weapons of defence. They would be useful in defending forts when stormed, in breaking charging lines of infantry, and especially in defending Western stockade forts against attacks of Indians.

Hand grenades were formerly made with fuses to be lighted by a match at the time of throwing; but the great uncertainty of this mode of firing caused them to go out of use. They would sometimes explode in the hand before thrown, and would sometimes be picked up by the enemy and tossed back. But Mr. Ketchum's grenades explode by impact, and they are so constructed as to be in no danger of bursting at any other time.

From the experiments which we saw, we came to the conclusion that this is a very safe and efficient shell; and as soon as the patents have been secured in this country and abroad, we shall give a more detailed description of the mode of discharging the grenade.

Messrs. Carhart, Needham & Co., the extensive melodeon manufacturers, No. 99 East Twenty-third street, are interested with Mr. Ketchum in this invention.

EX-COMMISSIONERS HOLT AND MASON.

Hon. Joseph Holt, so well known to our readers as formerly Commissioner of Patents, and more recently Secretary of War, has just addressed an eloquent and able letter to the people of Kentucky, urging them to support the Federal government in its endeavors to crush out rebellion. He scouts the idea of the armed neutrality position which Kentucky has assumed in this controversy, and calls upon the people to stand by the old flag Mr. Holt's loyalty to the government is unconditional; there is no *if* about it. He stands firm upon the constitution, and upholds its authority against all enemies.

Judge Mason has been appointed by the Governor of Iowa as one of the Commisioners for that State to negotiate a loan of $800,000 for war purposes; and it is reported that he will be commissioned a Brigadier-General in the army. The Judge was educated at West Point.

New Screw Steamer.

A new screw steamer, called the *Mercidita*, completed in this city for the Havana trade, made her trial trip last week. Her hull was built by E. Upton, of Williamsburgh, and her engines by Murphy, McCurry & Co., Beach street, this city. They are 300-horse power. The bearing boxes of the propellor are cellular, forming water chambers communicating with one another, and through which a current of cold water is continually flowing. This is for the purpose of preventing overheating of the shaft, without bringing the water into contact with the frictional surfaces. The shafts of propellers and paddle-wheel steamers are very liable to become overheated, and the common mode of preventing this is by keeping a stream of water flowing over the journal boxes. It has been found in practice, that the salt water thus applied oftentimes eats holes into the frictional surfaces, hence the application of the new kind of refrigerating journal boxes by Mr. A. Doig, engineer. The steamboat *Dutchess of Poughkeepsie*, running on the Hudson river, was fitted with such boxes last summer, and it is stated that they have been found very beneficial. These are the only two vessels to which such journal boxes have yet been applied.

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AMERIC AN COTTON STATISTICS.

An interesting article on "Statistics of Cotton Manufacture," taken from the eleventh annual report of the Boston Board of Trade, by Samuel Batchelder, Esq., has lately been published. We condense the following from its pages :—

In 1860 there were in Massachusetts 1,688,471 spindles and 41,620 looms. Since 1850 there has been a total increase of 31 per cent in the number of spindles; but during the past five years the ratio of the increase has been only 11 per cent, which is much lower than that of the same number of years since 1840.

The consumption of cotton in Massachusetts in 1850 was 95,032,975 pounds, or 73.70 for each spindle ; in 1855, the amount consumed was 105,851,749 pounds.

It is stated in this report that there is no positive data by which to determine the present number of spindles in the United States, but according to the census of 1850, there were 272,527,000 pounds of cotton consumed ; and by allowing 75 pounds to a spindle, there would have been 3,633,693. "If we add," says Mr. Batchelder, "twenty per cent for the increase of the next ten years, during which time the spindles in Massachusetts have increased 31 per cent, we shall have 4,360,430 for the number in the United States in 1860."

In Tennessee, Alabama, Georgia and South Carolina, there were 140,602 spindles, according to De Bow, in 1850, and the bales of cotton consumed were 60,000 ; but the statistics for that year make the consumption of bales in these States only 41,778. The report of the Philadelphia Board of Trade for 1860 gives the consumption of cotton in States north of Virginia at 760,218 bales, and in States south at 164,700, making a total of 924,918. Mr. Batchelder is of opinion, however, that 900,000 bales is probably nearest the truth.

In 1855 there were 314,996,567 yards of cotton cloth produced in Massachusetts, at a cost, for labor and material, of 7.76 cents per yard. The exportation of American goods is larger than many persons suppose. For the year ending June 30, 1860, the value of such exports amounted to $10,934,796. It is understood that goods to the value of $4,200,000 went directly to China from the ports of New York and Boston. The London *Economist* states that the total cotton goods and yarn exported from Great Britain last year amounted in value to £48,200,000, of which sum the United States took £4,635,000 (about $22,479,750). We therefore export cotton goods valued at nearly one-half that which we take from England. This is more favorable than most people imagine.

Mr. Batchelder says : "As to the future prospects of our cotton manufacture, the greatest apprehension seems to be on account of our relations with the Southern States. There is little doubt that we shall be able to obtain our supply of cotton at the market price, unless all the laws of trade are *nullified*." This is no doubt a sound conclusion, but it affords no satisfaction to any person. Cotton can always be obtained at the *market price*. It is stated that the value of the entire cotton manufactures of the United States in 1850 was $61,869,184, of which $57,134,760 as consumed at home and the rest exported ; and of this amount the free States produced $52,502,853. About seven per cent of this only is supplied to the fifteen slave States. Our foreign exports of cotton goods have increased rapidly. In 1850, they were valued at $4,734,424 ; the increase in ten years is $6,200,372.

A common opinion prevails that the increase of cotton machinery has kept in advance of the supply of cotton. Mr. Batchelder asserts that this is not the case. He gives some statistics of British manufacture in proof of this opinion. In 1856 the number of spindles in England and Wales was 25,818,576; looms, 275,590. In Scotland—spindles, 2,041,139 ; looms, 21,624. In Ireland—spindles, 150,502 ; looms, 1,633. The increase of spindles in Great Britain in six years was 30 per cent. At the present time it is believed that there are 33,612,260 spindles in England, Ireland and Scotland, allowing an increase of 20 per cent for the last four years. The increase of cotton machinery in England has been proportionally greater than in the United States. The average number of spindles to the loom in Great Britain is 84, or about twice the proportion of this country. More cotton is exported in the form of yarn, and the looms are driven with greater speed in England. But the whole increase of cotton machinery in Europe and America, from 1850 to 1860, is stated to be no more than 50 per cent, while the average increase of the cotton crop in the same period has been no less than 64 per cent. Instead of the machinery increasing beyond the power of the cotton crop to supply the spindles (as has been predicted for some years past) the supply of cotton has been increasing beyond the spindles. At the close of 1860 there were 403,000 bales of American cotton in Liverpool. Mr. Batchelder states that he had hoped to obtain from Washington some statistics from the census of 1860 ; but on application at the Census Bureau, the manufacturing statistics had not been made up so as to afford any information on the subject.

HEAD DRESS FOR SOLDIERS.

The ladies connected with various churches in our cities and villages have exhibited praiseworthy alacrity and benevolence in preparing articles of dress for the volunteer soldiers. The most conspicuous articles furnished have been Havelocks. This is a new head dress for American troops. It derives its name from General Havelock, the hero of Lucknow, whose pictures represent him with one placed over his military cap. They have always been worn, however, by the natives of India, and have long been in use by British soldiers in that tropical clime. As made for our soldiers, they are simply composed of white cotton, linen or woolen cloth, forming a light thin cover for the cap, with a flap hanging upon the neck. Of what use, it may be asked, are such articles for soldiers, especially the back flap? Their ostensible object is to afford protection for the head and neck from the effects of the burning sun, and thus prevent sunstroke when soldiers are on a march, drilling, or in an engagement. White cloth reflects the rays of light ; hence the utility of the Havelock for the protection of the head, but the use of the flap is not so apparent ; still, it is very beneficial, and all persons should know the reason why.

The great nervous highway of the brain is the spinal column running down the neck and back from the head. The neck and spine, therefore, require to be nearly as carefully guarded as the head ; hence the use of the flap on the Havelock. The Arabian in the desert invariably wears one end of his turban hanging down over his neck ; and, beside this, he has a long strip of cloth running down the middle of his back. The Hindoo soldier wears a thick cotton turban, with a thin piece of iron (generally an old horse shoe) sewed on the top, as a defence from sword cuts. The Indian army have their Havelocks wadded in the crown.

The head and neck are perhaps the most important parts of a soldier's body that require attention. Not only the form and color, but the nature of the material, should be objects of consideration in making the cap covers. As it regards color, white is the best for hot climates. The tube of a thermometer placed in the sun, and covered with white cotton sheeting, showed a temperature of 35.5° Fah.; covered with white linen, it showed a temperature of 39.6° ; covered with dark blue cloth, it showed a temperature of 42° ; and with red cloth, it reached the same figure. Blue and red colored cloths absorb more heat when exposed to the rays of the sun than white ; hence the utility of white Havelocks. And as it regards material, bleached cotton is superior to linen, but white woolen flannel is believed to be superior to either linen or cotton, because it is a better non-conductor.

The troops intended for the South ought, therefore, to be all supplied with Havelocks, which will enable them to work in the sun without experiencing any effects from its rays. For want of such a simple protection, several of the soldiers at Washington have been incapacitated. When it is remembered that the British soldiers in India, with Havelocks, were able to stand the intense heat of the country without injurious effects, the value of this protection cannot be over-estimated.

ARMY WORM.—The army worm has been and still is very destructive in some parts of Tennessee, and many fields of grain have been destroyed. We may soon expect to see it charged by the secession editors of that State that the government of the United States has let loose the army worm to prey with "more than savage atrocity upon the innocent fields of grain in that State." If we may believe what we read, an army is worming its way down toward Tennessee that may prove more uncomfortable than the army worm.

INTERESTING FACTS ABOUT UNITED STATES ARSENALS.

One of the most extensive arsenals in the United States is located at Bridesburg, Philadelphia. The *Inquirer* of that city, gives an interesting account of this arsenal, from which we select a few extracts.

The grounds are trapezoidal in shape, and occupy an area of 60 acres, surrounded by a solid wall of masonry 10 feet high. The Superintendent's office is situated very nearly in the center of the grounds, eastward of which lies the east arsenal or storeroom for arms. It is a handsome edifice, three stories in hight, rough cast, to imitate granite. The roof is of slate, and is surrounded by a neat wooden railing, painted white. On the first floor are about 30,000 muskets, 1,000 rifles, 300 Hall's carbines, 300 pistols, and 100 cavalry musketoons. The muskets arrived last week. On the second floor there are about 400 rifles, 300 cavalry sabres, and 100 pistols with holsters, slings and pouches. On the third floor the arms are ranged most beautifully in racks, painted to a snowy whiteness ; 740 muskets of the improved pattern, and 900 of the old flint locks, together with 150 pistols, carbines and musketoons, are pivoted on small circular racks, very much resembling umbrella stands. In one room are 2,000 muskets that were brought from Harper's Ferry. Sights are being fixed to them, and 1,300 of them have been already rifled.

THE INSPECTION OF ARMS.

On the floor are a number of unvarnished mahogany cases, which, upon being opened, revealed a set of exquisitely finished inspecting instruments, consisting of guide plates for different bores, callipers for measuring shot, also a pair of callipers that will measure the thousandth part of an inch, by means of the vernier. But the most wonderful of all was an instrument for measuring the flaws and inaccuracies on the inside of a gun. It was made in the arsenal manufactory, at a cost of $200.

GUN METALS.

All the metals employed in gun casting have their defects. Cast iron is quite tenacious, if a sufficient weight is employed, and tolerably hard ; but its comparative elasticity (an important element of strength) is so small that its tenacity is invariably destroyed after a certain number of applications of the straining force. The difficulty of obtaining sound castings, by reason of the unequal shrinkage of the metal, is unfavorable, so much so that the strongest "high" iron, by its superior contraction, does not as a rule, make so strong a gun as a metal in itself weaker.

Bronze, a more tenacious compound, has also serious defects. Its density and tenacity are considerable, but its softness unfits it, for reasons already stated, for long service, particularly when rifled. Wrought iron has a tensile strength double that of the best cast iron, and is much more elastic, but somewhat softer. Authorities generally unite in stating that it was, when most in use, an improvement on cast iron, but the difficulty of producing large masses sound and homogeneous, has prevented its extensive introduction. In fact, without such instrument as that referred to, to gage the barrels of guns, the difficulty in the way of obtaining reliable weapons would be almost insurmountable.

PERCUSSION CAPS.

In one of the main rooms of the first floor the interesting process of making percussion caps is carried on. The caps are stamped out on three presses, which bear this inscription : "Invented by George Wright, Washington Arsenal." Eighty thousand caps are turned out per day. They are constructed of an alloy of copper, which is rolled out into thin sheets, and cut into inch strips. These strips are wound upon a reel, whence they pass beneath a dye, which, at one stroke shapes their worldly destiny.

They are then made to revolve upon a steel horizontal disk, so as to pass beneath a funnel filled with fulminating powder. Receiving their quota of the detonating dust, they are conveyed to another department, where they are treated to a coat of varnish, and are then packed up for shipment.

One hundred and sixty thousand percussion caps can be turned out at the Bridesburg arsenal in one day.

BULLET MAKING.

In the same apartment is a wonderful machine that presses out eighty musket bullets per minute—a decided improvement on the old method of casting.

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Next, a machine for rifling gun barrels. About forty barrels are bored here in a single day.

And last of the mechanlcal wonders is a machine that presses out brass tubes for the neat cannon primers.

But the old engine deserves some mention. It is of fifteen-horse power, and is, therefore, scarcely sufficient to drive the vast machinery of the establishment. It was built at the Franklin Iron Works, in Philadelphia, in 1852.

SUPPLIES FOR THE ARSENAL.

All the supplies of caps and primers used by the government are made at this arsenal. The friction primers may be said to have originated here, in so far as they are a modification of the old Prussian primers.

THE LABORATORY.

The laboratory is a low one story brick building, where the fulminating powder is being made. It consists of quicksilver dissolved in nitric acid and precipitated in alcohol. Some idea of the expensiveness of the ingredients may be formed when it is stated that $200 worth of materials are worked up in a day. Over 3,000 pounds of nitric acid are required for every fifteen barrels of alcohol, to make 3,000 pounds of the powder. Mr. Perkens has perhaps manufactured more of this powder, in the last eight years, during which he has been connected with the arsenal, than any other man or company of men in the United States.

The laboratory is situated at a considerable distance from the other buildings, so that in the event of an explosion, the chances of damage to life and property will be materially lessened.

The nitric storehouse is nearly isolated from the main buildings. Upwards of four hundred thousand pounds of this explosive agent are stored here, constituting, as it does, one of the main ingredients in the manufacture of gunpowder.

Two weeks since a sheet of Maynard primers exploded while under the press, making a report equal to that occasioned by the discharge of a 6-pounder. It may not be amiss here to state that 150,000 of these primers were finished in April last, and 70,000 more are now being made up.

To the southeast of the laboratory stands the powder magazine, a granite building, with but little architectural pretensions. It contains about 30,000 pounds of powder.

Altogether there are one hundred and twenty men employed in the establishment, separate gangs being at work on guns day and night. Upon the ground are a considerable number of monster iron guns, that are preserved as trophies of the war of 1812, during which they were captured on board the English ship *Lady Johnson*.

SPRINGFIELD (MASS) ARMORY.

A correspondent of the *Tribune* gives some very interesting facts about the Springfield (Mass.) Armory.

In 1855 the three buildings comprising the arsenal contained two hundred and eighty-seven thousand stand of arms, and the works here have since then been manufacturing them at the rate of about one thousand per month, so that to the above number we may add seventy-two thousand as the product of the past six years. At the present time there are but thirty thousand remaining in the arsenal, and these are being boxed up and sent away for actual service every day. There are now employed in the various shops and arsenals about seven hundred men, and this force is increased as fast as room can be found for them to work in. They now turn out over one hundred rifled muskets per day, and the superintendent intends to complete three thousand this month, and to exceed this number during the coming months. This is nearly three times the number formerly produced, but is by no means the limit to which the works are capable. Several new rifling machines are nearly ready for settling up, which will materially add to the productive power of the establishment, as the number of muskets which one machine is capable of rifling is limited to the number of hours which it runs. This is not the case with other portions of the musket, an increase in the number of men being only necessary to increase production.

The rifled musket manufactured by the United States Armory, in this city, is one of the finest infantry weapons in the world. It carries a Minie ball weighing one ounce, and is capable of killing a man at a distance of one mile. Some five or six years since Captain Benton, of the Ordnance Department at Washington, was sent here to experiment with this weapon, and with Maynard's primer, and I sometimes accompanied him in his target practising expeditions. He had two targets—one placed at the distance of half a mile, and the other at a full mile. With the half-mile target he could place a ball within the small ring every time, while with the mile-target he could put a ball within a ring of four feet diameter.

The Minié ball, as the reader probably knows, is conical in shape, with a cavity in the end, which rests upon the powder. This cavity being filled with gas by the decomposition or explosion of the powder, adds greatly to the propulsive force of the charge, while the special motion given to the ball by the rifling process preserves for it a steady and straight course.

The rifled musket manufactured here is similar to that made at Enfield, England, the machinery for making which was imported from this country, and was manufactured at the Arms Manufacturing Company in Chicopee, from patterns obtained at the Springfield Armory. It is a singular fact that almost the first demand for the Enfield rifles should be made from the State which six years ago furnished the English authorities with the machinery for manufacturing them. The machinery was not only obtained here for their manufacture, but Mr. Burton, for many years connected with this armory, was selected to take charge of the English works at England.

The bayonet which is attached to the rifled muskets is of the sword pattern, and a handsome as well as a formidable weapon. The weight of the musket and bayonet is nine pounds.

The muskets which are now being sent away, of the older patterns, have not been touched for seven years, and yet such is the dryness of the atmosphere where the arsenals are located that not a particle of rust can be observed upon them, nor even are the barrels tarnished in the slightest manner.

Formerly visitors were admitted with the utmost freedom to any parts of the works, the gates remaining open and having no guards, but since the bombardment of Fort Sumter they have been vigilantly watched night and day, to prevent injury from lurking emissaries of Jeff. Davis, and no stranger is admitted inside of the gates unless accompanied by a guard.

The large amount of money disbursed by the Government at this time must be of immense advantage to the citizens of this town, and greatly lessen the stagnation of business consequent upon the political troubles.

Another very important manufactory of arms is located at Chicopee (formerly a part of Springfield) known as the Ames Manufacturing Company. Yesterday I paid a visit to the works of this Company, and was very much gratified with the activity displayed in this extensive establishment. This Company employs at the present time 500 men in the manufacture of rifled cannon, James's patent projectiles, swords of various kinds, and the sword bayonet used upon the Sharp's and Colt's rifles. All the weapons turned out by this establishment are of the most approved pattern and excellent workmanship, and in the hands of our brave volunteers will do excellent service. In the way of brass cannon, they complete a battery a week—or rather, seven pieces—one over a full battery. In the shop there are a large number of guns of different calibers, recently received from various points, which are to be rifled for the use of the James conical ball and shell. Among them were some Columbiads which throw round shot weighing 64 lbs. but when rifled will throw balls of 124 lbs. weight, and do good execution at a distance of seven miles. These will make splendid peace-makers, and will do more toward cementing the Union than the return of ten times the number of sable contrabands which Ben. Butler has so wisely employed at Old Point Comfort.

The rifling process, while it adds greatly to the accuracy of the ball, also enables the gun to take a shot of double the weight which it is able to carry in round shot; thus the 6-pounders are by this process turned into 12-pounders, and other sizes are enlarged in the same proportion.

Of the projectiles 400 shot and shell are turned out daily. The shape of the shot and shell is similar to the Minie ball, and the principle of action is the same, but the material, instead of being lead, as in the latter case, is mainly of iron, the lead only being used to form about one-twelfth of its weight. The manufacture of the shot is quite interesting, and I will try briefly to describe it. The conical section of the ball is composed entirely of cast iron, and occupies about one-half of its length, the other half having a frame work of iron, with a cavity in the center as in the ordinary Minie balls. The balls are cast in this manner in one piece; the cavities are then filled with sand, and a covering of sheet tin is put around the frame-work, which is then filled up with molten lead. When they are fired from the gun, the gas arising from the explosion of the powder escapes into the cavity of the ball, forcing the lead into the grooves of the cannon, and thus rendering the action similar to that of the Minié ball. The shell is similar in structure to the ball, only the conical section is hollow, until filled with powder, and contains near its extreme point a small brass tube connecting by a fuse with the powder. The tube is furnished with a nipple for a percussion cap, and the shell is instantly exploded the moment it strikes anything with sufficient force to explode the cap.

The Ames Manufacturing Company turn out about three thousand swords per month, and about one thousand bayonets. The latter are different in form from those manufactured by the United States, resembling the saber, and being longer, and furnished with a handle, so as to be capable of being used independently of the rifle.

This company has recently made four rifling machines for the use of the government, one of which is now in operation on Governor's Island, and the others will shortly be in operation at the Navy Yard in Washington. These rifling machines will render our ordnance vastly more effective, and in times like these literally worth more than their weight in gold.

Balloon Reconnoisance and Aeriel Telegraph.

On the 18th June, Prof. Lowe made a balloon ascent at Washington, for the purpose of trying whether balloons could be used successfully in making military reconnoisances, and telegraphing to the earth the results of the observations taken above. Professor Lowe was accompanied by General Burns, of the Telegraph Company, and H. C. Robinson, operator. The first message was then sent to the President. It was as follow :—

BALLOON ENTERPRISE, }
WASHINGTON, June 17. {

TO THE PRESIDENT OF THE UNITED STATES:

SIR: This Point of observation commands an area nearly fifty miles in diameter. The city, with its girdle of encampments, presents a superb scene. I take great pleasure in sending you this first dispatch ever telegraphed from an ariel station, and in acknowledging my indebtedness to your encouragement for the opportunity of demonstrating the availability of the science of æronautics in the military service of the country.

Yours respectfully,
T. S. C. LOWE.

The wire of the telegraph was reeled off as the balloon ascended, and was connected with an instrument on the ground and another in the balloon. Of course there is no difficulty in maintaining telegraphic communication in this manner; but so far as we know, this is the first time a telegraphic message was sent from a balloon, and on that account it is very interesting.

The elevation attained is stated to have been moderate, but it is said to have been satisfactory to the President and several members of the War Department. We believe that in calm weather balloon reconnoisances are perfectly practicable under competent management.

Binding.

Subscribers desiring their numbers bound can have them done at this office in the best manner, in handsome, gilt embossed covers, muslin; price, 50c. Covers sent by express, price 40c.; by mail, 50c., which includes postage.

DEATH OF COUNT CAVOUR.—By the latest foreign arrival we have advices that Count Cavour died at Turin on the 6th inst. He has been the Prime Minister of Victor Emanuel through all his glorious struggle for the redemption of Italy, and was recognized as one of the greatest statemen of the age.

IMMENSE WARLIKE PREPARATIONS IN ENGLAND.—Very extensive fortifications are now being erected on the river Thames, all of which are to be mounted with 100-pounder Armstrong guns.

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ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING JUNE 4, 1861.

Reported Officially for the Scientific American.

*** Pamphlets giving full particulars of the mode of applying for patents, under the new law which went into force March 4, 1861, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

1,453.—L. H. Allen, of Amherst, Mass., for an Improvement in Forming Wire Cloth Dish Covers:

I claim, first, The expanding die block, A B, in combination with its handle rod, C, and a suitable spring latch, b, as and for the purposes set forth.

Second, I claim the spring fingers described, composed of a piece, q, of stone, and a metalic shell, h, when said fingers are arranged so as to operate as set forth.

Third, I claim the handle, D, with its latch, e, and spring plate, f, in combination with the notched rod, C, all arranged and combined as and for the purposes set forth.

[This invention relates to a new and useful tool for making woven wire dish covers in a more simple and expeditious manner than hitherto.]

1,454.—Wm. C. Baker, of New York City, for an Improvement in Steam Heating Apparatus:

I claim raising the temperature of the current of air which enters below the manicoil or heating surface above the freezing point before the said current of air reaches the lower portion of the said coil or heating surface, substantially as and for the purposes described.

1,455.—Zadoc M. Beall, of Russellville, Ky., for an Improvement in Plows:

I claim the arrangement of the cutter, C, shank, D, brace, E, plowshare, S, beam, A, and handles, B B, the whole being constructed and combined and operating in the manner and for the purposes shown and explained.

1,456.—H. T. Betts, of Springfield, Mass., for an Improvement in Carriage Steps:

I claim the bent lever, G, and slotted arm, E, or their mechanical equivalents, when operating substantially in the manner and for the purpose set forth.

1,457.—Louis Bonard, of New York City, for an Improvement in Circular Looms for Weaving Hats:

I claim, first, The rotary rings, T and P, constructed with corresponding slots to guide the keys, as set forth, and operating in connection with stationary weft carriers.

Second, I claim the twin wheels, C and D, and notched ring, F, or their equivalents, for elevating the keys, as set forth.

Third, I claim the slide way, U, applied to the wagon, U, and operating in combination with pins, R, and a notched elevating wheel of any suitable form, substantially as and for the purpose set forth.

Fourth, I claim the laying mechanism, A B C D E F G H, constructed and operating substantially as and for the purposes set forth.

Fifth, I claim the form, K, and bell, K, combined and operating substantially as and for the purposes set forth.

Sixth, I claim the india-rubber rings applied to the keys, Q, to afford an elastic attachment for the warp, as set forth.

1,458.—Moses Bucklin, of Grafton, N. H., for an Improvement in Harrows:

I claim the arrangement of the diverging side bars, B B, provided with double winged teeth, in connection with the tail-board, E, and bars, d, the whole being constructed, arranged and used as and for the purpose specified.

1,459.—R. Bullard, of Litchfield, Mich., for an Improvement in Bee Hives:

I claim the combination and arrangement of the comb frames, E, suspended by a single pivot on each side, with the slats, f f, and removable caps, g g, provided with the notches, or series of notches, c c, substantially in the manner and for the purposes shown and described.

I also claim the acute or V-shaped channel, in combination with an astragal face, or its equivalent, substantially as and for the purposes set forth.

1,460.—L. S. Bunnell, of Troy, N. Y., for an Improvement in Pipe Butts:

I claim forming the butt, A, of two parts, b c, connected by a hinge or joint, d, and provided with a catch or fastening, B, substantially as and for the purpose set forth.

[The object of this invention is to enable a person to attach, while the engine is at work, pipes of different sizes, as may be required, to the butt of the hose, without being exposed to the water.]

1,461.—M. C. Burleigh, of Somersworth, N.H., for an Improvement in Molding Stove Griddles:

I claim the employment or use with the pattern, A, of the movable tongue, B, substantially as described, fitted in the pattern, and in such relation with its recesses, a, as to admit of a lip being cast with the griddle, as and for the purpose set forth.

[This invention consists in providing the pattern with a tongue or an adjustable plate, whereby the griddle may be cast without any core boxes, or chills, which are necessary in the ordinary plan of molding, in order to form a means to connect the handle to the griddle, for the purpose of moving the latter when required.]

1,462.—Samuel Cameron, of Pittsburgh, Pa., for an Improved Spike Machine:

I claim the rack, e e e e' e', on which the hot bar is thrown as it comes from the reducing rolls, combined and arranged relatively with the shears, D D, substantially as set forth.

1,463.—A. H. Clark, of Fond du Lac, Wis., for an Improvement in Shingle Machines:

I claim, first, The spring, G, with its friction roller, h, and pin, i, in combination with the sliding dog, b, and curved holding bar, E, substantially as and for the purposes described.

Second, The stationary guides, e e, working in the groove, d, in table, B, substantially as described, for keeping the table in a steady position.

Third, Combining with bed, J, pivoted as described, the slotted wheel or cam, K, rod, L, square shaft, K, having cogs, t t, on its end, which are struck by the pins, v, on the table, B, for tilting said bed, as and for the purposes described.

[This invention relates to certain novel improvements on shingle machines which were patented by Kasson Freeman, for obtaining a more perfect and expeditious mode of shifting the bolt to effect the taper of the shingles, and of griping and releasing the bolt from which the shingles are sawed.

1,464.—M. Cain and W. Stelfox, of Austin, Texas, for an Improvement in Cultivators:

We claim the arrangement of diamond plows, f f, the crescent coulter, k, sweep, g, wing hinges, m m, wings, b b, slides, c and d, beam, a, and handles, h, as described, for the purposes set forth.

1,465.—H. M. Collier, of Binghampton, N. Y., for an Improved Washing Machine:

I claim constructing the rotating cylinder, A, of a washing machine of a series of half rolls, a, deeply knurled, and placed at short intervals, and with their smooth surfaces outside, substantially as described, so that the cylinder when in motion offers the least resistance to the water, and that the meshes or openings with their sharp edges cut the water and force the same into the cylinder and against the clothes, facilitating the washing, and insuring a supply and a constant change of the water in the cylinder.

[This invention relates to that class of washing machines in which the washing is effected by placing the clothes into a cylinder, which rotates in a semi-cylindrical tub, the water from the tub being admitted into the cylinder through suitable apertures in its sides, and the action of the water on the clothes to be washed is facilitated by a number of balls, which, together with the clothes, are placed into the cylinder.]

1,466.—F. E. Cook, of Guilford, O., for an Improvement in Machines for Hulling and Cleaning Clover Seed:

I claim the combination of the threshing cylinder, B, hulling cylinder, K, shaking screens, D and M, conveying apron, G, and fan, P Q, arranged and operating in the manner and for the purposes shown and described.

1,467.—Robert Cornelius, of Philadelphia, Pa., for an Improved Method of Lighting Gas by Electricity:

I claim, first, The employment of the electrophorus in connection with the metallic wire attached to the gas burner for lighting the gas, substantially as described.

Second, The attaching the metallic handle to the hard rubber plate, the handle terminating in a small metallic button, C, substantially as described.

1,468.—Geo. Dare, of Auburn, N. Y., for an Improved Mode of Hanging Window Sash:

I claim the employment of the jointed or hinged strip, D, secured to and used in connection with the sash, substantially as and for the purpose set forth.

1,469.—A. M. George, of Nashua, N. H., and J. W. Carter, of Brooklyn, N. Y., for an Improved Carpet Cleaner:

We claim, first, The beaters, E, in connection with the rollers, D D, the yielding bars, F, blast tubes, H H, with or without the brush, G, arranged for joint operation substantially as and for the purpose set forth.

Second, The particular construction of the beaters, E, to wit, their bars, j, being made to pass each other at their ends to ensure the action of said bars on the whole surface of the carpet, as described.

Third, The connecting of the yielding bars, F, by cords, m m, one or more, and placing said bars, F, relatively with the beaters, E, as and for the purpose specified.

[The object of this invention is to obtain a machine for cleaning or dusting carpets that will supersede the usual manual process by performing the work with great rapidity, and in a far more effectual or thorough manner.]

1,470.—E. Gore, of Belvidere, Ill., for an Improved Washing Machine:

I claim the oscillating rubbers, substantially and for the purposes set forth.

1,471.—G. B. Griffin, of Madison, Wis., for an Improved Clothes Wringer:

I claim, first, The employment in wringing machines of the spool-shaped guide rollers, E E', arranged to operate in combination with the soft surface pressure rollers, B C, substantially in the manner and for the purpose set forth.

Second, The employment on clothes wringing machines of the yielding leg or legs, a, adapted to yield in a plane parallel to the axes of the rollers, substantially in the manner and for the purpose set forth.

1,472.—M. Grout & C. Lawton, of Oak Grove, Wis., for an Improvement in Seeding Machines:

We claim the combination of the hopper, A, stocks, G, teeth, H I J, bar, K, rod, c, lever, L, independent seed slides, N N', gage arms, i, and stirrups, M, constructed, arranged and operating substantially as and for the purposes set forth.

1,473.—J. H. Havens, of Troy, O., for an Improvement in the Frames of Buggy Tops:

I claim the combination of standard, B, with arms, I and H, a longitudinal braced arm with wings, K and J, the whole so constructed and arranged as and for the purposes set forth.

1,474.—A. G. Holcomb, of New York City, for an Improved Electro-Magnet:

I claim, first, Combining with the positive or attractive force of the electro-magnet that of a permanent steel magnet, placed at or near the end of the core or cores of the electro-magnet, opposite to that of the armature.

Second, The use of a permanent steel magnet connected with the rear end of the core or cores of the electro-magnet, and carried round in a position parallel, or nearly so, with the periphery of the helix or helices.

Third, The combination with the armature, C, of the adjustable slide, D, and set screw, d, in the manner and for the purposes set forth.

Fourth, The adjusting screws, F F', or either of them, when used in the described combination with the stretched wire spring, E, of the armature, for the purpose explained.

1,475.—R. F. Joynes, of Bristol, R. I., for an Improvement in Cultivators:

I claim the construction and arrangement of the inclosing box, A, and cover, B, in the manner and for the purpose set forth.

I also claim the arrangement and combination of the wheels, G G, posts, H H, bearing plates, I I, and nuts, L L, substantially in the manner and for the purpose specified.

I also claim the arrangement of the openings, a a, side plates, b b, and knives, M M M or N N N, substantially as and for the purpose described.

I also claim the arrangement of the double sets of knives, M M M and N N N, in combination with the reversible handle, C, so that the machine may cultivate in both directions, substantially as specified.

1,476.—J. H. Junkins, of Upper Sandusky, Ohio, for an Improvement in the Trusses of Bridges:

I claim, first, The construction of angular arches in bridges, formed by double sections of straight timbers laterally arranged, when the same shall be combined with combination angle blocks, m, substantially as and for the purposes described.

Second, I claim, in combination with the arched truss, as described, the arrangement of rod, e, adjustable brace and straining rods, a a, straining rods, b b, extension arms, r r, suspension stirrups, c c c, braces, H H, iron plate, 12 Vs D D, bolt and nut, 9, thereby forming a continuous, adjustable brace around the whole structure, and firmly binding together all the parts, the whole being arranged substantially as and for the purposes set forth.

Third, I claim the arrangement of braces, H H, iron plate, 12, and bolt with nut, 9, when used in combination with Vs D D, and stirrup, C, for the purpose of distributing the weight by pressure from the center of floor on chords and arches, B B and C C, substantially as described.

1,477.—J. H. Landell, of Newark, N. J., for an Improvement in Tent Fixtures:

I claim, first, The employment of a conical ferule at the top of the tent pole, in combination with the rings, e and i, and chains, f, the whole being constructed, arranged and operated in the manner and for the purpose set forth.

Second, I claim the employment of the ferule, m, at the bottom of the tent pole, in combination with the tripod, n r, the whole being constructed, arranged and operated in the manner and for the purpose set forth.

1,478.—C. M. Lane, of Cincinnati, Ohio, for an Improvement in Hinges:

I claim a hinge, constructed as described and shown, combining the strength of the fast joint with the advantages of the loose joint hinges.

1,479.—Horace Maxson, of Hopkinton, R. I., for an Improvement in Rope Walks:

I claim the employment of the carriage, D, containing or supporting two or more tops, or their equivalents, with the ways or rails, C C, and the partitions, E, arranged and operating together substantially in the manner, and so as to obtain the advantages set forth.

1,480.—Oliver Reynolds, of Webster, N. Y., for an Improvement in Beehives:

I claim constructing sections consisting each of a frame of suitable dimensions for a full sized comb, when provided with suspended tubes, d d, arranged transversely of the comb structure in such a manner that the bees may fill the frame with comb wrought around said tubes, and, at the same time, they will be left to form passage ways for the working bees, substantially as set forth.

I also claim the double glass partitions, G, with the slides, I, for surrounding the warm and maintaining greater uniformity of temperature in winter, substantially as described.

I also claim the winter portal, K, or attachment, consisting of a box with screen, L, and tubular orifice, m, constructed and applied substantially as and for the purpose set forth.

I further claim the hanging moth trap, r, constructed substantially in the manner and for the purpose set forth.

1,481.—W. W. Robinson, of Ripon, Wis., for an Improve- in Pumps:

I claim the combination with the hollow piston rod, D, and the pump otherwise constructed as described, of the rack, H, sector, J, rock-shaft, J, pitman, L, crank, M, and crankshaft, N, all arranged as and for the purposes set forth.

[This invention relates to a novel device for operating a double-acting force pump, having a hollow discharging piston.]

1,482.—Decatur Pittman, of Fort Madison, Iowa, for an Improvement in Animal Traps:

I claim the animal trap described, consisting of a board, A, having a hole, B, through it, and the spiked bar, C, spring, D, adjusting screw, E, trigger, I, and lever, J, all combined and arranged as set forth.

[This invention relates to an improved trap for catching and killing large or very small animals. It consists in combining with a board, having a hole through it, a lever, which is arranged across the hole in the board, so that, when the animal enters this hole the lever will be pushed upwards and detach a trigger, which will let fly a spiked beam that is acted upon by a strong spring, and spike the animal securely to the trap.]

1,483.—J. C. Plumer, of Portland, Maine, for an Improvement in Boots and Shoes:

I claim, first, The combination of a sole that is flat or convex exteriorly with an in-sole that is convex at its upper surface, substantially as described.

Second, A shank that is convex at its upper surface, substantially as described.

Third, The combination of an elongated heel with the sole, substantially as described.

Fourth, The combination of the front piece of the upper leather with quarters of unequal length, substantially as described.

1,484.—Van Buren Ryerson, of New York City, for an Improvement in Modes of Condensing Mercury in Amalgamating Vessels:

I claim the process of separating gold or silver from foreign substances by condensing the vapor of mercury in a vessel containing the substances from which the gold or silver are to be separated, substantially as described, so that the mercury shall be diffused and subdivided, and in that condition caused to pass through the charge, the better to take up the particles of metal by amalgamation, as described.

I also claim the application of superheated steam to the charge of mercury and of gold or silver in pulverized or granular foreign substances, substantially as described, for the purpose of vaporizing the charge of mercury so that it may be diffused and sub-divided, and to agitate the entire charge, as described, when this is applied in combination with the process of condensation, substantially as described, that the mercury may be condensed in minute particles, and in that condition pass through the charge the better to take up the particles of gold or silver by amalgamation, as described.

1,485.—L. M. Stearns, of Cardiff, N. Y., for an Improvement in Plows:

I claim combining with clevis, A, constructed and applied to the plow beam, as described, the forked coupling iron, consisting of the arms, h h, pivoted to the clevis by pin, f, and arms, i i, embracing the whiffletree, and pivoted thereto by the pin, k, and the check pin, g, all arranged and operating as described.

[The object of this invention is to attach a whiffletree to a plow clevis in such a manner that the whiffletree will not get under the horse's feet in turning the plow, and also that the team will have a much better purchase on the plow in turning it and keeping the beam steady in heavy plowing, at the same time the improved clevis will admit of all the adjustments desirable, and it will be strong and substantial.]

1,486.—W. H. Towers, of New York City, for an Improved Boot-jack:

I claim the undetachable sliding bar, D, constructed and operating within the socket, in combination with the boot or shoe heel, substantially as described.

1,487.—Isaac Tyson, Jr., of Baltimore, Md., for an Improved Article of Paint:

I claim the new article of manufacture, being a composition suitable for painting, to wit, a composition consisting of black dirt and oil, so mixed as to form a paint, which may be used either with or without the addition of other materials to make it dry or vary its color.

1,488.—G. B. Wiggin and J. H. Hoard, of Providence, R. I., for an Improved Steam Trap:

We claim the combination with the outer case or chamber, A, of a brass or other metal pipe, B, coupling, C, steel or other metal rod, D, lever, E, valve, H, valve spindle guides, I and L, inlet and outlet, O and P, constructed and operating as described for the purpose set forth.

1,489.—W. S. Wilmot, of New York City, for an Improvement in Rakes for Harvesters:

I claim the combination of the pivoted sliding bar, D, and vibratory bar, E, with frame, C, and rake, G, substantially in the manner and for the purposes shown and described.

[This invention relates to an improvement in that class of raking devices for harvesters in which the rake is placed below the platform, the latter being slotted longitudinally, and the rake teeth, when moving in one direction, passing up through the slots, so as to rake the cut grain from the platform, and passing down out of the slots below the platform when moving back to the spot from whence it commences its working movement.

1,490.—Jesse Bartoo (assignor to himself and Zina A. Hemstreth), of East Aurora, N. Y., for an Improvement in Excavators:

I claim so arranging the changing lever, M, catch, Q, and spring, R, with reference to the radial frame, I, including gear wheels, J J', and scraper, G, that as the scraper is raised it will move the catch in a manner to release its hold upon the lever and allow the heavy end of the lever to drop, and thereby ungear with the driving wheel, for the purposes and substantially as set forth.

I also claim the arrangement of the draught bar, V, in such manner that the line of draught may be changed to correspond with the central line of resistance, in combination with two scrapers arranged side by side, for the purposes and substantially as described.

1,491.—J. A. De Brame (assignor to himself and Benjamin Gurney), of New York City, for an Improvement in Skates:

I claim the button fastening, g, or its equivalent, when secured to a sliding plate, f, which works in a groove in the skate plate, G, and is operated by a pin, h, substantially as and for the purposes set forth.

[This invention relates to an improvement in securing skates to the soles of boots, wherein sliding metallic buttons, which are affixed to the skates, are made to catch into slots in plates which are secured to the bottom of the boot, thereby securing the skate to the boot without straps or clamps, as hitherto.]

1,492.—Wm. M. Fuller (assignor to himself and Geo. W. Chandler), of Chicago, Ill., for an Improvement in Sewing Machines:

I claim, first, The needle slide, b, the pawl, d, and the inclined plane e, substantially as described, arranged for feeding the cloth for the stitches.

Second, The slotted looper, o, and its guide hook, w, combined for the purpose specified.

Third, I also claim a needle with a horizontal shifting motion, as de-

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scribed, combined with a slotted looper, as described, for the purpose of making a series of stitches.

1,493.—Isaac Goodspeed, of Norwich, Conn., assignor to A. A. Goodspeed, of Putnam, Conn., and E. S. Stebbins, of Worcester, Mass., for an Improvement in Cork Machines:

I claim, first, The changeable conical patterns, b and c, arranged in the machine substantially as described.

Second, I claim the adjustable screws, r, or their equivalent, for the purposes set forth.

1,494.—T. S. Hudson (assignor to himself and Thomas Leighton), of East Cambridge, Mass., for an Improvement in Barometer Inkstands:

I claim the improved barometric inkstand, as made with the semi-dome or tunnel, C, or the same and a cover, D, arranged and combined with the ink fountain and its neck, and to operate therewith substantially as specified.

1,495.—E. S. Scripture (assignor to himself and Edward White), of New York City, for an Improvement in Axle Collars:

I claim, first, The metallic cellular collar, made in the manner shown, and for the purpose or purposes set forth and described.

Second, I claim the sectional slide packers, made in the manner and for the purpose described.

Third, I also claim the metallic cellular collar, the sectional slide packer, with its flange, in combination with the protecting collar, flange and gasket, when the same shall be used substantially in the manner as shown, and for the purpose or purposes set forth and described.

1,496.—Russell Smith (assignor to S. S. Wheeler), of Danbury, Conn., for an Improvement in Machines for Felting Hat Bodies:

I claim the spring, E, having a curvature concentric, or nearly so, to the barrel, B, in combination with the slides, d d', and rollers, D D' and C C, of a hat felting or sizing machine, when operated by the slide, G, and lever, H, or their equivalents, substantially as shown.

1,497.—Caspar Zwicki (assignor to John Mason, Anthony Snyder and Nicholas Snyder), of Pittsburgh, Pa., for an Improvemeni in Looms:

I claim, in combination with the cams, F, on the fast-moving shaft, B, for operating the rods, G, the cam, I, on the slow shaft, K, for shifting said rods, substantially as and for the purpose described.

I also claim, in combination with the cams, F, secured to the upper shaft of the loom, the rods, G, levers, H and M, and pickerstaffs, O, when constructed and operated substantially in the manner herein described.

I also claim a three-sided shuttle, the two straight sides of which are in contact with the shuttle race, and bear the relation of an acute angle to each other, while the third or outer side is convex, substantially as and for the purpose described.

I also claim, in combination with a three-sided shuttle, as described, a shuttle race, the two sides of which bear the relation to each other of an acute angle, to conform to the sides of the shuttle and allow the shuttle to run close to or in contact with the reed frame, substantially in the manner described.

RE-ISSUES.

88.—G. D. Baldwin, of New York City, assignee of J. H. Butterworth, of Dover, N. J., for an Improvement in Door Locks. Patented April 11, 1846, and extended

I claim, first, The pawl described, or its equivalent, when combined with a movable talon that can yield to the pressure of the key bit or key to a point beyond its range, in the manner and for the purpose set forth.

Second, I claim the use or employment of one or more sets of rotating cam or disk plates, such as described, having two or more in a set, on the same stem, when so combined with a tumbler or tumblers that lock the main bolt, so that it cannot be withdrawn until all the plates are rotated in such a position relative to the tumbler that the resisting parts can enter the notches in the circular cam plates, pass within the line of their periphery, and so allow the tumbler to withdraw from contact with and resistance to the withdrawal of the bolt.

Third, I claim the use or employment of cam or disk plates, two or more, in a set having the same center or key bolt, when so constructed that one plate only is attached to the key bolt, the next plate being moved by the pin projecting from its surface coming in contact with the ends of the slits described, or in any analagous manner that allows the plate acted upon by the key to move, during a part of its revolution, without engaging and carrying around the next plate.

Fourth, I claim the use or employment of plates such as are described, two or more in a set, when so constructed and arranged as to require the motion of the key to be reversed, in order to set each succeeding plate into such a position that the tumblers can descend into their notches and relieve the bolt.

Fifth, I claim the use of a plurality of cam or disk plates in one set, operated by one key, key bolt or stem, when so constructed that the plates are to be set consecutively by means of the same key, key bolt, stem, or their equivalent, each plate to its own proper position, according to the existing combination, by the aid of the same index, so as to relieve the bolt from the tumbler or other mechanism combined with the plates, that has kept the bolt from being drawn back.

Sixth, I claim the use or employment of a disk or cam plates, such as described, combined by levers or their equivalent with the talon that draws back the bolt, when so arranged that the talon is thereby withdrawn beyond the range of the keybit, and only allowed to come within its range so as to be acted upon by it when the plates have been brought into such a position as to allow that part of the levers that rest upon the edges of the plates to pass into the notches with the line of their periphery.

Seventh, I claim separate pieces of metal, 2 2 2 2, moving upon pins, when used in connection with cam plates, so as to change the point of contact between the plates themselves, and thus diversify, regularly or irregularly, the combination of permutation locks.

89.—Richard Vose, of New York City, for an Improved Car Spring. Patented Jan. 3, 1860:

I claim placing the india-rubber disks of said spring between interposed disks formed of some fibrous material, substantially in the manner and for the purpose set forth.

When the india-rubber disks in a car spring are placed between interposed disks formed of some fibrous material, I also claim combining internally-grooved metallic rings, C C, with the peripheries of said disks, substantially in the manner and for the purpose set forth.

Notes and Queries

H. T., of Pa.—It is stated that Paul Jones hoisted the first American flag ever displayed, on board of the *Alfred*, a brig of 30 guns. This was early in the year 1776. The device on the flag is not positively known, but it is stated to have been a pine tree, with a rattlesnake coiled at its roots. Paul Jones scoured the British coast and bearded the lion in his den in the *Ranger*, a ship carrying only 18 guns.

J. L., of Mass.—To coat small tin buttons with black varnish, introduce them into the varnish with a perforated dipper, lift them out, allow them to drip, and then introduce them into a drying oven. The varnish should be kept quite hot and the buttons separated from each other when placed in the oven to dry. They may require two coats to cover them perfectly.

W. B. G., of N. Y.—The fish-tail propeller is not well adapted for vesseis, because it produces a vibratory motion, and this should always be avoided if possible. Such propellers, we believe, have been tried in England, and have not succeeded.

H. E., of Mich.—We are in daily communication with the Patent Office, and the business is going on favorably.

T. H. W., of Ohio.—Gun cotton ignites instantaneously that it is liable to burst the barrels of rifles, otherwise it would be preferable to gunpowper, on account of its greater cleanliness. Use coarse or slow igniting powder for your rifle to avoid the recoil incident to the use of fine-grained powder when the bullet fits snugly the barrel.

W. S. R., of N. Y.—The density of lead is not increased by hammering and pressure. When perfectly solid, it is but very slightly compressible.

E. W. F., of Pa.—Your plan of a water tank for a target to measure the penetrating power of projectiles seems to us a good one, were it not for the inconvenience of the water running out through the shot holes. There is a far simpler plan than yours for obtaining the varying twist in rifle grooves.

D. H. P., of N. H.—The application of a percussion cap to to the point of a bombshell or explosive projectile of any kind is not new. Dr. Read, of Ala., took patents, through this office, in various European countries, in 1856, for a shell which was provided with a cap to produce explosion in coming in contact with a ship or any other obstacle. The government, under Floyd's administration of the War Department, aided Mr. Read in his experiments at West Point, and we presume his shells are in use in the Confederate States.

Money Received

At the Scientific American Office on account of Patent Office business, during one week preceding Wednesday, June 19, 1861:—

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Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office from June 12 to Wednesday, June 19, 1861:—

L. B., of Mich.; J. F. W., of N. Y.; J. H., of Wis.; D. McK., of N. Y.; J. & M., of N. Y.; H. K., of Conn. (2 cases); S. C., of N. Y.; T. R., of N. Y.; J. W. P., of Ind.; S. & F., of N. Y.; S. N., of Conn.; A. K., of N. Y.; J. McN., of Pa.; T. R. R., of Ohio; A. L. W., of Mass.; G. B., of England; T. O. H., of N. Y.; M. L. G., of Ill.; P. & L., of Mich.; D. & Co., of N. Y.; D. E. T., of N. Y.; S. M. R., of Mass.

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